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Tessa's Family Day

A Reading A-Z Level Z Benchmark Book

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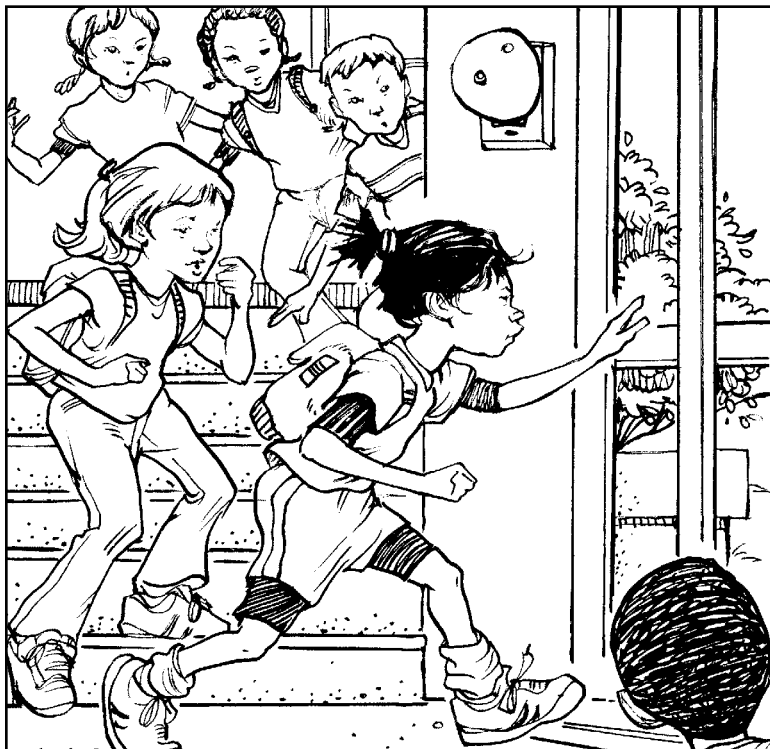
Tessa's Family Day



Written by Racheal Rice • Illustrated by Joel Snyder

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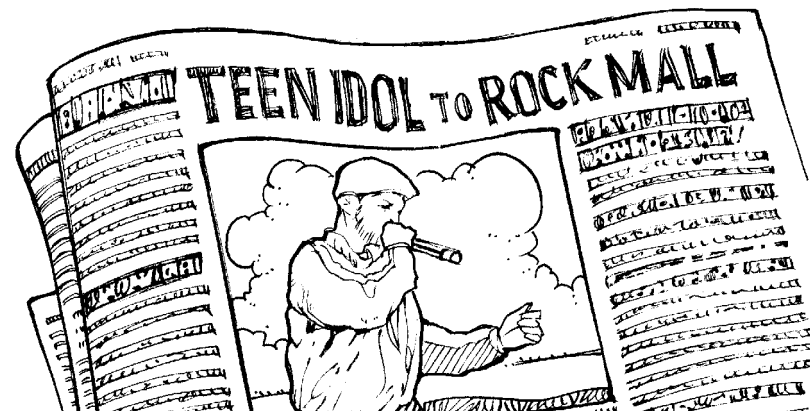
Correlation

LEVEL Z	
Fountas & Pinnell	V
Reading Recovery	29
DRA	N/A



Table of Contents

Concert Makes Waves	4
Family Day Runs Aground.....	6
Stewing on the Sandbar	9
Struggling Loose with the Tide	11
Smooth Sailing Ahead.....	14
Glossary.....	16



Concert Makes Waves

Bree squealed excitedly as Tessa bounced around the living room grinning like a fool and waving the newspaper up and down. Blake Baker, their favorite hip-hop rock icon, would be performing at the local megamall in two weeks. "Amazing! Terrific! Fantastic! I can't believe it, our first rock concert!" Bree exclaimed.

"I know. My mom will totally freak. She doesn't like Blake Baker because of that unfortunate incident with the **paparazzi**, but since she can't find anything to disapprove of in his lyrics, she can't object to me listening to him," Tessa explained defiantly.

"She can't object to you listening to him," said Bree, "but she can object to you attending the concert, even if it is free."

"Oh, I hope she doesn't want to invite herself to make sure we 'behave'," Tessa snorted, imitating her mom's voice. "How embarrassing would that be?"

"Your mom is really wonderful," Bree insisted quietly but sternly after Tessa brought up her mother. The two hadn't been communicating well lately and Bree was concerned about her friend.

"She has to let me go," Tessa practically pleaded. "It's on a Saturday, which is family day, but she allowed Trevor to attend that recognition dinner at the statehouse on a Saturday when his wrestling team won the state championships. It's the same idea," Tessa declared.

"Trevor earned that dinner. You didn't earn a trip to a concert in the mall," Bree reminded her.



Tessa looked at her friend, whose habit of being almost *too* honest really irritated her right now.

"Oh, well then, I guess I should go ask my *wonderful* mother about the concert," Tessa retorted. "It's two weeks away, she can't say no with so much advance notice."

Bree shook her head back and forth and watched Tessa bound out the front door and across the street to her own house.

Family Day Runs Aground

Tessa crept through the front door so she could gauge her mother's mood before approaching her about the concert. Lately Mom had been on Misery Island. Tessa surprisingly discovered her mother smiling and humming as she prepared dinner.

Before she could think about what to say, the words just poured out of Tessa's mouth like water gushing over a waterfall.

"Mom, guess who's going to give a concert at the megamall in two weeks? It's Blake Baker! Can you believe it? My idol is going to be here, in our little town, giving a free, live **performance**. It's on a Saturday, but not for two weeks. You just have to let me go with Bree, you just have to."

Tessa's mother peered carefully at her daughter.

"Tessa, I've already **volunteered** all of us to help on Saturday with the local food bank's food drive. You and Trevor are slated for sorting duty to keep the canned foods and the boxes of dried goods separate. Your dad and I will be organizing the volunteers and checking on the way the food crates are loaded into the truck for delivery to the donation center."



Tessa's heart dropped in her chest. Not only would she miss the concert, but she would also be forced into manual labor.

"That's so unfair, Mom," Tessa complained. "You never consider how I feel when you volunteer me for things. Who wants to sort food all day long? I don't. I won't. You can't make me!"

Tessa's mother let the words hang between them for a moment.

"Tessa, I know how you feel . . ."

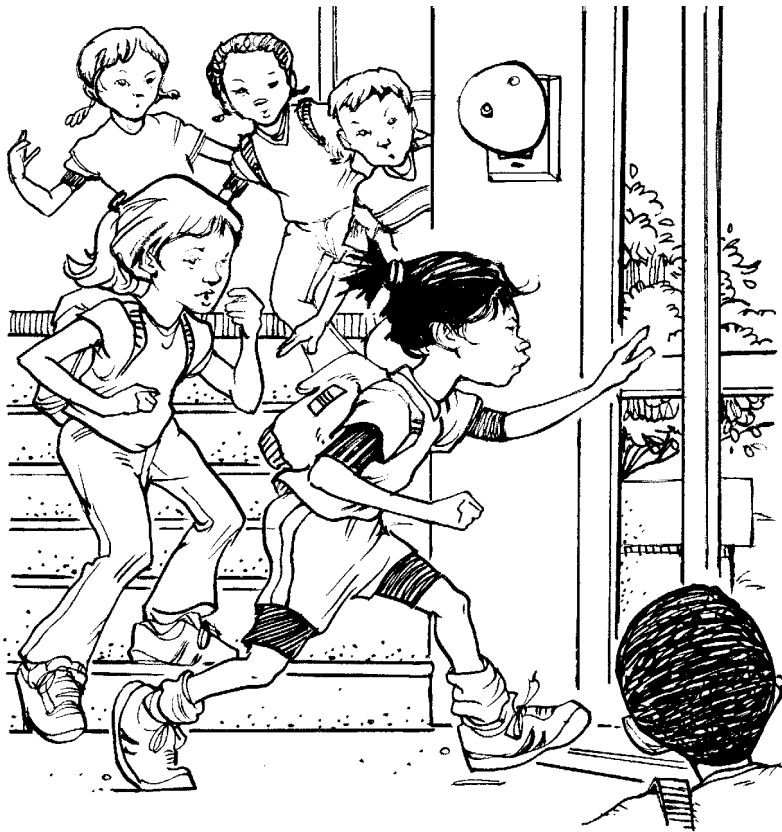
"No, you don't!" Tessa shouted.

"Please do not raise your voice at me, Tessa. The food bank people rely on us to provide help. They can't supply the necessary services people require without **support** from volunteers. Besides, you know how important family day is. We discussed the **principles** that we believe family day represents when we started setting aside special time to be together. We all agreed that family time takes priority over everything else. You'll present yourself at that food drive young lady, end of story."

"Fine," Tessa stated curtly. "I'm going to my room to do homework."

Tessa moved like greased lightning. She couldn't bolt out of the kitchen quickly enough. Tessa attempted to shrug off the tears that were about to rain down, but once her bedroom door closed, she couldn't prevent them from pouring down her cheeks.

On the following day at school, Tessa explained to Bree the **argument** that had occurred with her mother. Bree tried to console her friend, but she also reminded Tessa of the importance of sticking with **commitments**, which prompted Tessa to accuse Bree of defending her mother and effectively ended the conversation. Bree decided to give Tessa some breathing room to sort things out for herself, which meant for the rest of the week, the girls barely spoke.



Stewing on the Sandbar

On Friday when Tessa arrived home from school, feeling absolutely terrible about how she'd exploded at Bree again when her friend asked how she was feeling, she found her mother crying in the kitchen. *Good*, Tessa thought, *now, she really does know how I feel*. Tessa hurried upstairs to her room before her mother could realize she was home.

When Tessa awoke Saturday morning, her thoughts wandered to why her mother was crying. *Could she be as upset as I am about our fights? I bet it's work that is bothering her and not our fights—work's more important anyway.*

Tessa switched her thoughts to today's family activity—a water park—an experience she'd anticipated since her dad first read the newspaper article about the park's opening. Tessa's dad was the coach for the local high school's swim team, who called him "Coach Neptune" after the mythical god of the seas; and Tessa's mom had swum competitively in college.

Tessa's parents always said she and Trevor came naturally by their love of water recreation—and Tessa did love the substance from which all life springs, as her mother would say. Tessa's mom often shared a story with anyone who would listen about how each of her children seemed to swim like backstroking Olympians even in the womb.

Tessa decided to try to forget about the events of the past week and concentrate on enjoying a day of water slides, inflatable beach toys, and machine-generated waves.



Struggling Loose with the Tide

After a stiff picnic lunch with her family later in the afternoon, and then trying to enjoy becoming pruney in a quiet corner of the wave pool, Tessa braced herself as she saw her mother swimming toward her.

"Tessa, we should talk," her mother stated softly.

"Okay," agreed Tessa, causing ripples in the H₂O as she crossed her arms over her chest.

"Do you remember when you were a little girl and I was home all the time?"

"Sure," answered Tessa, not sure where this conversation was headed.

"Well, since I went back to work, things have been very different between you and me."

"You went back to work ages ago," Tessa reminded her.

"That's true. But recently I've realized how much I miss staying home with you and your brother and volunteering at your schools. It's really become clear to me how much you're growing up without me around. I'm angry with myself for what I'm missing—how much I miss you."

Tessa's stomach dropped like a lead balloon, and her arms followed suit. Immediately she wished she could take back every horrid thought her mind created about her mother, especially over the past week.

"I miss you, too. In fact, Mom, I miss you so much it makes me angry sometimes, too. We don't talk anymore—at least not like we did before. We have family day, but Dad and Trevor are always around."

"I know, honey," Tessa's mother agreed, "and it won't ever be like it was before, but I think if we **compromise**, we can both be happier."

Tessa looked warily at her mother, whose face seemed to glow with expectation like the sun's reflection off the water.

"I propose that I pick you up after school Tuesday and Wednesday so we can help the food bank prepare for the donation drive and sort any food that comes in early," Tessa's mother said, smiling tentatively. "That will fulfill our promise to the organization and give us some time together. Regularly, on Tuesdays after school, you and I can bond over water aerobics. On Saturday, your father and Trevor will still work during the food drive, and Saturday will continue to be family day, so we'll all have dinner and play games that night."

"However, as an olive branch to properly start our mother-daughter bonding time, this Saturday, you and I will attend that Blake Baker concert."

"Really? Mom, that's phenomenal," Tessa said, practically bubbling over with excitement. "Wahoo!"

"But wait, you really want to go to the concert?"

"I want to go with you. Besides, I need to give Blake Baker a second chance to make a better **impression** on me," Mom said, smiling. "Everyone deserves the chance to make up for dreadful behavior."

Smooth Sailing Ahead

Tessa's **effervescence** quieted. "I'm sorry, Mom. I'm sorry I didn't talk to you about why I was so angry because I thought you cared more about work than you did about me."

"I'm sorry, too, Tessa. You, Trevor, your dad—my family—are the most important things in this world. We have to better communicate our feelings to each other so we don't end up hurting each other's feelings again."

Tessa thought of a great analogy. "**Communication** is to our family as water is to life."

"Exactly," her mom said.

"I have the best plan for making things up to you, Mom. You'll be so proud of me, but it's a surprise."

"I can't wait to hear what you have planned," her mom said, knowing that whatever surprise Tessa held up her sleeve, she was assured they would be making a concerted effort to bond with each other.

"It'll be amazing, darling," Tessa said, striking her best movie star pose, "we'll do lunch."



Glossary

argument (<i>n.</i>)	a disagreement in which points of view are expressed in an often angry way (p. 8)
commitments (<i>n.</i>)	plans or activities that take up energy and cannot be avoided (p. 8)
communication (<i>n.</i>)	the exchange of information between two or more living things (p. 14)
compromise (<i>n.</i>)	a decision in which both sides in an argument give up something to reach an agreement (p. 12)
effervescence (<i>n.</i>)	the quality of liveliness or excitement similar to the process of a gas creating bubbles (p. 14)
impression (<i>n.</i>)	a lasting belief, understanding, or opinion of somebody or something (p. 13)
paparazzi (<i>n.</i>)	the plural of an Italian last name, now used to describe photographers who take candid photos of celebrities (p. 4)
performance (<i>n.</i>)	a show such as a play, a piece of music, or another kind of entertainment in front of an audience (p. 6)
principles (<i>n.</i>)	ideals or values (p. 8)
support (<i>n.</i>)	the help or encouragement somebody or something gets from others (p. 8)
volunteered (<i>v.</i>)	to have done work by choice and without pay (p. 7)

Reading a-z Running Record

Level Z

Student's Name _____ Date _____

Tessa's Family Day
176 words

Have the student read out loud as you record.

Assessed by _____

page	E = errors S-C = self-correction M = meaning S = structure V = visual	E	S-C	E			S-C		
				M	S	V	M	S	V
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5	"Oh, I hope she doesn't want to invite herself to make sure we 'behave'," Tessa snorted, imitating her mom's voice. "How embarrassing would that be?" "Your mom is really wonderful," Bree insisted quietly but sternly after Tessa brought up her mother.								
Totals									

Accuracy Rate:

Error Rate:

Self-correction Rate:

Violent Weather

A Reading A-Z Level Z Benchmark Book

Word Count: 1,413

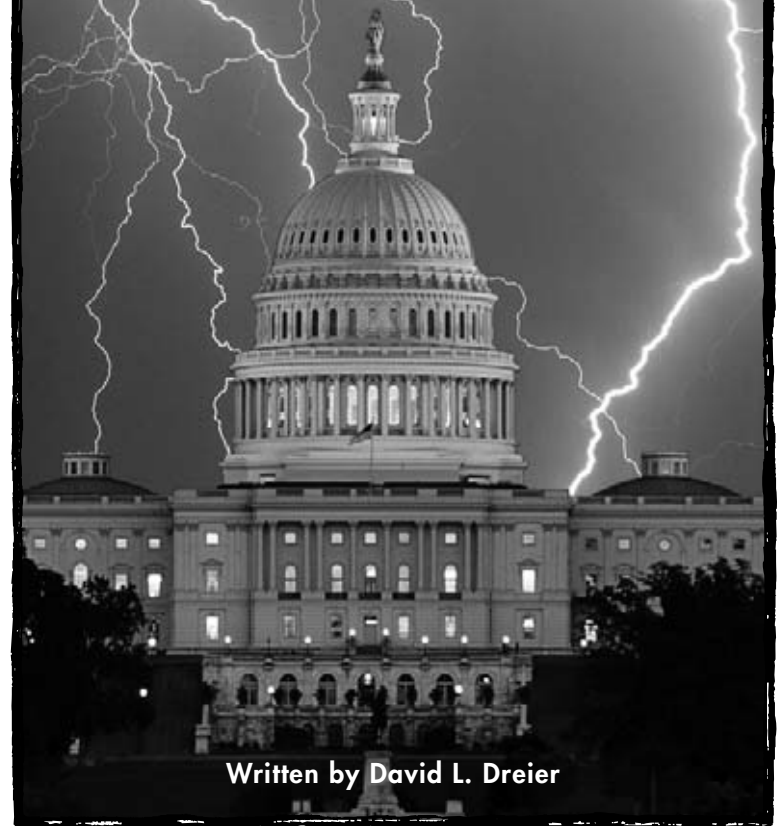



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Correlation

LEVEL Z	
Fountas & Pinnell	V
Reading Recovery	29
DRA	N/A



Table of Contents

When Mother Nature Gets Hostile	4
Thunderstorms.....	5
Tornadoes	9
Hurricanes.....	12
Conclusion	15
Glossary.....	16
Index	16

When Mother Nature Gets Hostile

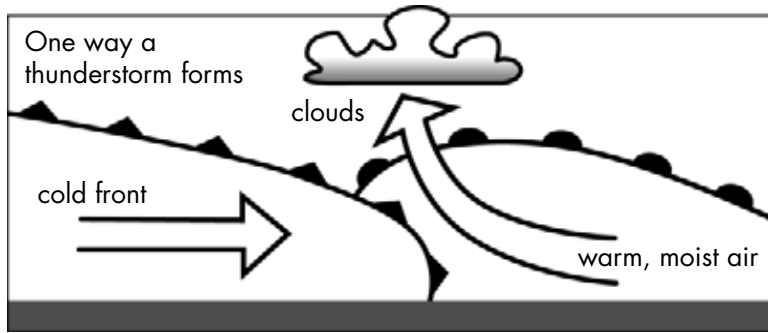
Many climates offer consistency, which helps maintain the smoothness of people's everyday lives. What adds texture are weather events that come with the progress of the seasons, such as when it warms up enough for a gentle spring rain or cools enough for the first winter snowfall. When the weather stays the same for too long a period, many people feel bored and anxiously await the next big change. Weather provides drama for people's everyday lives.

Sometimes, however, weather becomes more than dramatic, it develops into something downright dangerous and destructive. Raging thunderstorms, tornadoes, and hurricanes are weather events that are awesome—and frightening—in their intensity. On planet Earth,



these three phenomena of nature can wreak havoc when they occur.

A thunderstorm threatens a calm afternoon.



Thunderstorms

The most common violent-weather event is the thunderstorm. A major thunderstorm can dump several inches of rain on an area in a short amount of time and generate stiff winds. Dangers generated by thunderstorms include flash floods, hail, and lightning—with lightning being the most dangerous because it occurs with every thunderstorm.

Thunderstorms form when a large mass of warm, moist air rises high into the atmosphere and cools. One way warm air rises is by absorbing heat from the ground. This often happens on summer days as the ground gains plentiful heat from the Sun, and then loses it, warming the air above it. Warm, moist air can also be pushed aloft when it collides with a **cold front**. Cold air is denser than warm air, so the warm air rides up and over the boundary of a cold front.



As the warmer air reaches higher altitudes, it expands, which causes it to cool. After it chills enough, water vapor in the air condenses—turns from a gas to a liquid—and forms puffy clouds called cumulus clouds. Some cumulus clouds expand into **cumulonimbus clouds**—huge clouds with a large, spreading area at the top—that produce thunderstorms.

When great amounts of water have condensed within a cumulonimbus cloud, the water grows too heavy to stay in the cloud and it falls as rain. A major storm produces intense rainfall in a brief amount of time, which can cause flash flooding that wipes out farms, homes, and can even cause deaths for those unprepared for the massive downpour. At the same time, strong downdrafts of air from the cloud may produce stiff winds at ground level.

There are two main kinds of thunderstorms: ordinary and severe. Ordinary thunderstorms are the typical storms that occur in the summer, usually lasting from 30 to 60 minutes and providing welcome relief from the heat. Severe thunderstorms, also called **supercell thunderstorms**, are huge rotating storms that can last several hours, producing extremely heavy rains and high winds that increase people's anxiety. Severe thunderstorms may also generate hail with large hailstones—sometimes as big as baseballs, or even larger. About 10 percent of thunderstorms are classified as severe.



Lightning strikes the tall towers and buildings in Panama City, Panama.

The biggest danger from all thunderstorms is lightning. Lightning is literally a giant spark in the sky, and it can cause wildfires and it can kill.

Lightning is caused by a buildup of electric charges in storm clouds. A lightning bolt is a flow of electric charges seeking opposite charges either in the clouds or on the ground. The bolts that shoot down from the clouds to the ground are dangerous to people.

A lightning bolt passes through a narrow channel of air, which is flash heated to a temperature of about 54,000° Fahrenheit (30,000°C), or about five times hotter than the surface of the Sun! The explosive heat causes the air in the channel to expand violently. The expansion produces a shockwave that we hear as thunder, which is how thunderstorms get their name.



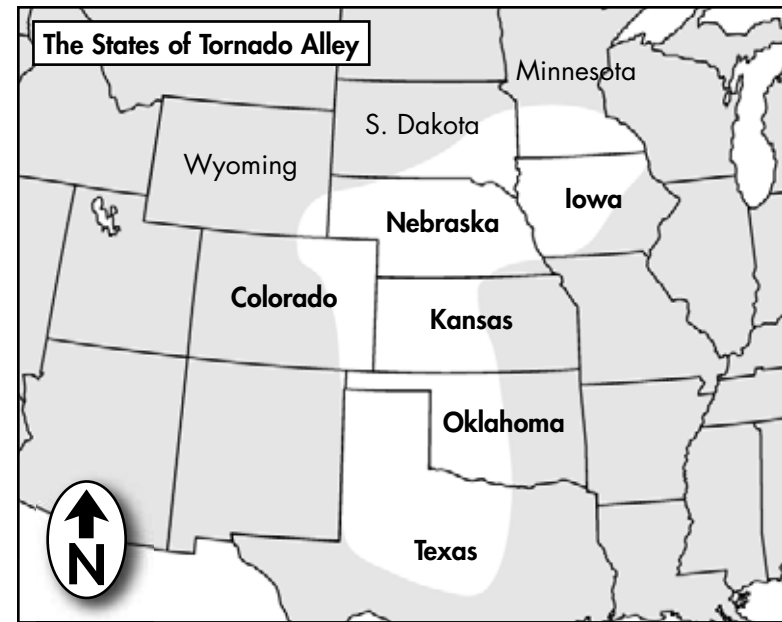
Lightning sparked this fire, which destroyed 20 homes.



Tornadoes

Some supercell thunderstorms generate the most violent weather phenomena on Earth—tornadoes. A tornado is a large, spinning funnel-shaped cloud that extends downward from the base of a large storm cloud. Many tornadoes have a narrow snakelike appearance, while others appear as wide columns up to a mile (1.6 km) across.

A tornado moves along the ground with a forward speed averaging 30 miles (48 km) per hour, though some travel more than twice that fast. The funnel produces a strong updraft, sucking up almost everything in its path that isn't securely fastened to the ground, including vehicles and mobile homes. Most tornadoes assume a dark appearance once they touch the ground, the result of dirt and debris they have sucked up.



Tornadoes can strike almost anywhere in the world, but about 75 percent of them occur in the United States. Approximately 750 tornadoes occur in the United States every year, killing an average of 100 people annually.

Most U.S. tornadoes occur in a large area of the central United States known as “Tornado Alley.” This Great Plains region—perfectly designed for the development of tornadoes—has flat terrain that allows cold, dry air from Canada to meet moist, warm air from the Gulf of Mexico. When large masses of these two kinds of air converge, the result is often supercell thunderstorms—perfect tornado-generators.

A major tornado can have winds that rotate at speeds faster than 300 miles (480 km) per hour. A really powerful tornado can tear a wood-frame house off its foundations and lift it far into the air. Its path of destruction may extend for up to 50 miles.

One of the most powerful tornadoes ever recorded ripped through suburban Oklahoma City on May 3, 1999, as part of a four-day onslaught of twisters in Tornado Alley. **Doppler radar** clocked the tornado's winds at 318 miles (512 km) per hour. The tornado killed 36 people and destroyed more than 10,000 homes and other buildings.



Oklahoma City residents search through debris for belongings after the May 3, 1999 tornado.

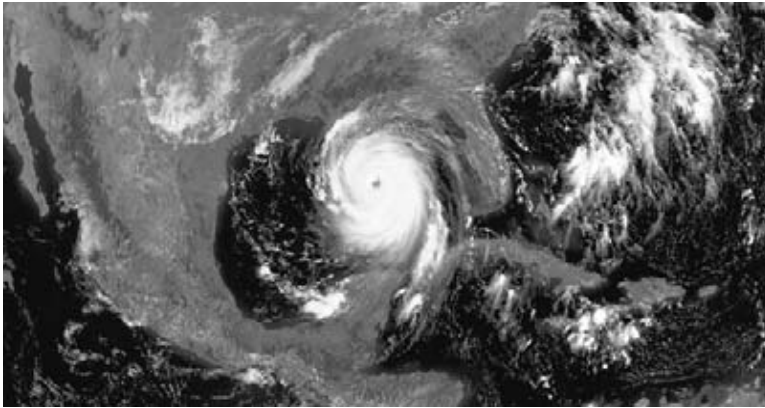
Hurricanes

For sheer violence in a limited area, nothing can match a major tornado. But people who live along seacoasts know that hurricanes can cause extensive destruction across a much wider swath of land.

A hurricane is an enormous rotating storm that develops above warm ocean waters in the summer or fall. Most hurricanes occur in the Atlantic Ocean, the Gulf of Mexico, and the Caribbean Sea, though some develop in the northeastern Pacific Ocean. The same kinds of storms occur in the Western Pacific and Indian oceans, where they are called typhoons or severe tropical cyclones.



The Indian Ocean island of Reunion braces for a severe tropical cyclone.



A satellite image of Hurricane Katrina just before it hit land in the southern United States

A hurricane starts with an area of low **air pressure**, with winds moving in a circular motion around it. The low-pressure area draws up warm, moist air from the sea below and grows into a tropical storm. The moisture condenses into clouds, releasing a great amount of energy. If the storm continues to grow, powered by that energy, its winds may reach a speed of 74 miles (119 km) per hour. At that point, the storm has become a hurricane.

From space, a hurricane looks like a huge pinwheel. The outer parts of the pinwheel form a towering mass of rapidly circling storm clouds. At the center of the pinwheel is a calm area called the “eye” of the hurricane, where there is no wind or rain. A hurricane can be up to 600 miles (965 km) wide.

When a hurricane comes ashore, it drenches coastal areas with hammering rains and buffets them with heavy winds. The winds of a major hurricane can exceed 150 miles (240 km) per hour—strong enough to rip the roofs off many houses. Gusts from a major hurricane can match the wind speed of the most powerful tornado.

The biggest danger for low-lying communities is a wall of water, called the storm surge, which is forced toward land by the strength of the winds. The storm surge of a major hurricane can be up to 20 feet (6 m) high, and it can cause extensive flooding and loss of life far inland.



Two weeks after Hurricane Katrina, Venice, Louisiana, still had at least two feet of water everywhere.

The worst hurricane to hit the United States in recent years was Hurricane Katrina in August 2005. The hurricane caused severe destruction

and killed thousands along the Gulf Coast in the states of Louisiana, Mississippi, Alabama, Georgia, and Florida.



Conclusion

People can protect themselves from some elements of devastating weather, but they can't escape them entirely. Parts of the United States with no tornadoes or hurricanes may have broiling summers or harsh winters. On the West Coast, earthquakes and brush fires often make up for the moderate weather.

When choosing a place to live, it's probably most important for people—rather than worrying about the extremes or the worst calamities that may occur—to consider an area's general climate. That's the weather that will provide both the consistency and the drama they seek.

Glossary

air pressure (<i>n.</i>)	the downward pressure of the atmosphere (p. 13)
cold front (<i>n.</i>)	a large mass of cold (or cool), dry air moving down from a northern region (p. 5)
cumulonimbus clouds (<i>n.</i>)	towering storm clouds with spreading top (p. 6)
Doppler radar (<i>n.</i>)	a device that can detect the presence of a tornado and measure the speed of its winds (p. 11)
supercell thunderstorm (<i>n.</i>)	enormous rotating thunderstorms that can produce tornadoes (p. 7)

Index

clouds, 6	lightning, 5, 8
eye of hurricane, 13	Oklahoma City, 11
Great Plains, 10	storm surge, 14
hail, 7	Tornado Alley, 10
Hurricane Katrina, 14	typhoons, 12

Reading a-z Running Record

Level Z

Student's Name _____ Date _____

Violent Weather
156 words

Have the student read out loud as you record.

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page	E = errors S-C = self-correction M = meaning S = structure V = visual	E	S-C	E			S-C		
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Accuracy Rate:

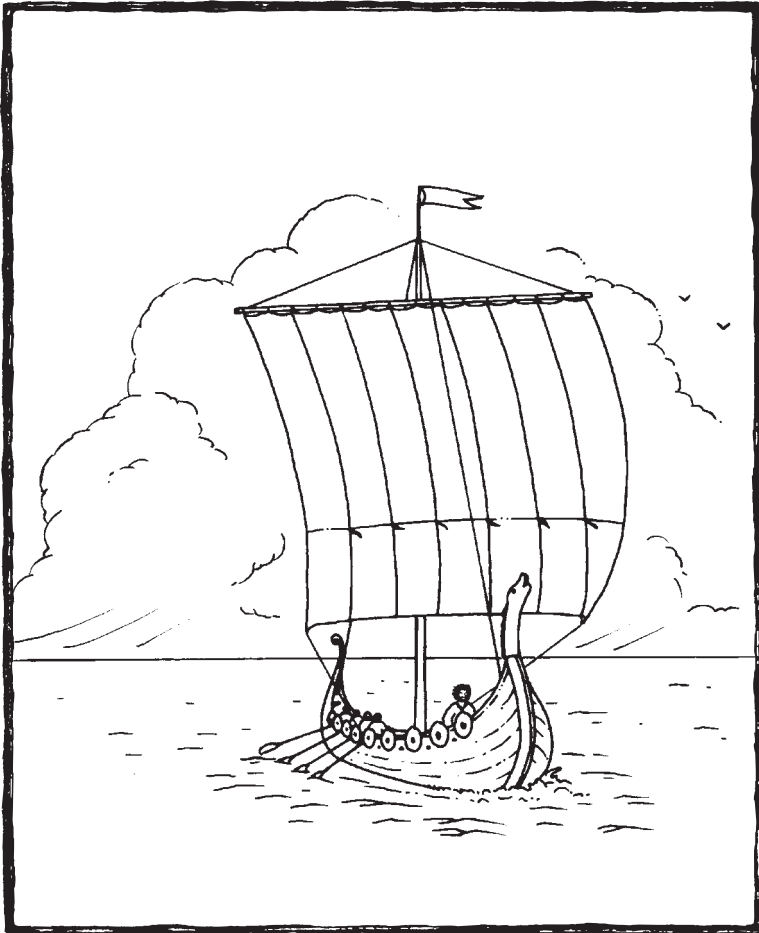
Error Rate:

Self-correction Rate:

Vikings

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Word Count: 2,142



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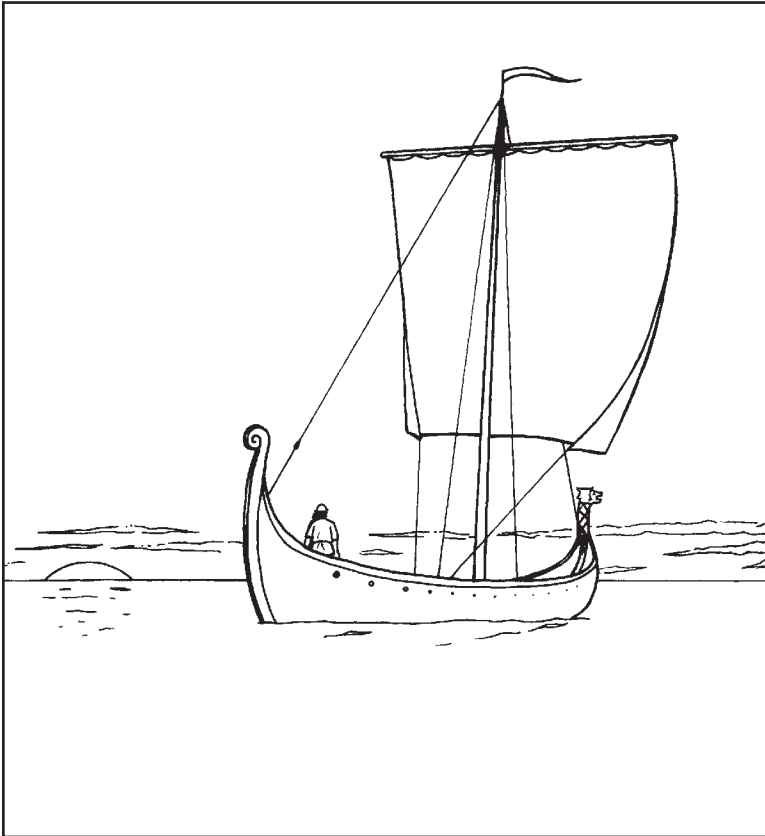
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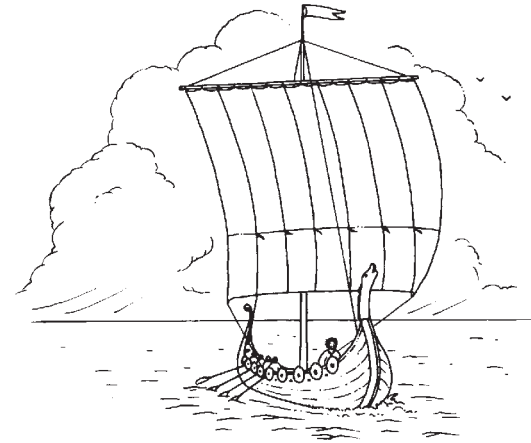
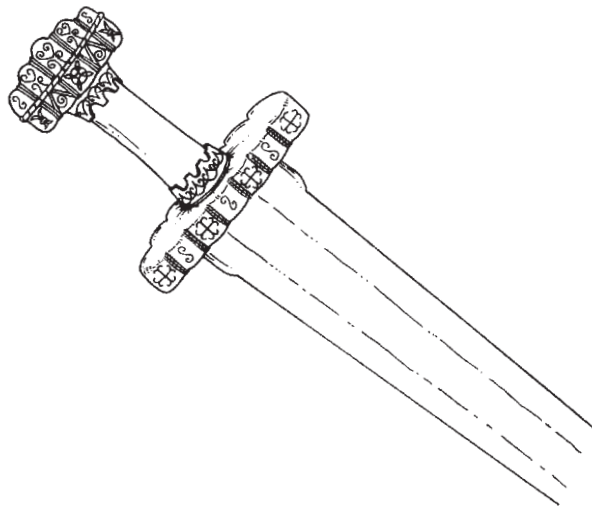
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Correlation

LEVEL Z	
Fountas & Pinnell	U-W
Reading Recovery	N/A
DRA	50

TABLE OF CONTENTS

Introduction	4
Viking Warriors	9
Viking Ships	10
Discovering a New Land	12
Eric the Red	14
Leif Ericson	16
Other Viking Conquests.....	20
Glossary	22
Index	24



INTRODUCTION

What do you think of when you hear the word *Vikings*? Were Vikings fierce warriors or skilled explorers? Do you think of them as merchants who traveled the world, or do you think of them as epic poets? The Vikings **excelled** at all these **roles** and were also accomplished scientists, farmers, **shipwrights**, and fisherfolk.

We tend to think of Vikings as large and powerful raiders whose quick attacks from the sea struck fear and terror into the hearts of people across Europe. It is true that the Vikings were brave warriors who seldom lost a battle and that their reputation as fierce fighters scared everyone. Yet, their greatest **attributes** may have been their love of exploration and their courage to seek the edges of the vast, unknown ocean.

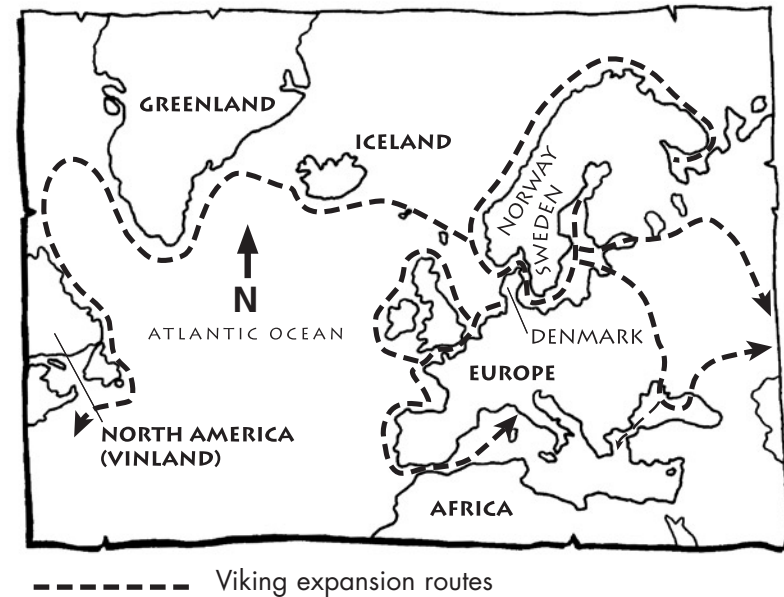
The great age of the Vikings spanned the years between AD 793 and 1066. In that short amount of time, the Vikings ranged far from their harsh northern homelands, sailing west to discover Iceland, Greenland, and North America, long before Christopher Columbus was even born. Seeking riches, they invaded many cities throughout Europe, Russia, North Africa, and even the Middle East.

Their ships were fast and could carry many warriors. Some of their ships even carried horses. Using their sailing skills, thirst for adventure, and bravery, the Vikings conquered many lands.

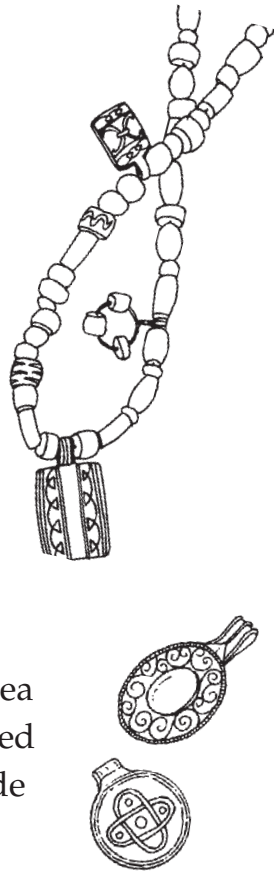


People during the Viking age called Vikings the Nordic people, or *Norsemen*—men from the north. They were as harsh and rugged as the coastal lands from which they came—lands that we now know as Norway, Sweden, and Denmark. At that early time, all Nordic people spoke one language. That language has been almost entirely **preserved** in the modern-day speech of the people of Iceland.

The Vikings of Denmark headed south. The Vikings of Sweden went into Eastern Europe. And the Vikings of Norway headed west. All of them greatly influenced the lands they invaded and changed the course of history wherever they went.



It was natural for Nordic people to seek their fortune on the ocean. Many of them were trained from a young age to be skilled sailors and navigators. Some sailed away for the adventure. Others did it because they could not earn their living at home. Within each family, only the oldest son inherited the family's land. Younger sons could work for the oldest son, or leave the area. Because of this rule, many young men went to sea to find their fortunes. Some turned to fishing or trading. Others made their living by stealing.



The word *Viking* comes from an Old Norse word *vik*, meaning a bay or **fjord**. A *Viking* was a person from the fjords or bays where ships would arrive and depart. To go “a-Viking” was to strike out in ships with the goal of raiding or plundering nearby lands. Many Norsemen went “a-Viking” for part of the year to supplement their families’ incomes.

The unguarded small towns and monasteries along the coasts of Britain and France were easy targets. **Monasteries** were frequent targets of Viking raids because they had few defenses and often contained many valuable objects. As **pagans**, the Vikings did not consider monasteries to be off-limits from attack.

Raiding Vikings would sail in quickly and steal the year's harvest and other valuables from villages. After the success of these early raids, they soon began to raid larger towns and even major cities. Eventually they attacked Paris and Hamburg—two of the largest cities of Europe at that time. However, Vikings were not only interested in **plunder**. They also settled peacefully in many areas and established trade routes in many parts of the world. Vikings settling in Ireland founded the city of Dublin, which eventually became the capital. Vikings traveling east founded the country of Russia.

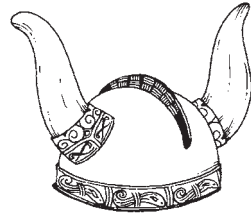
Do You Know?

The shallow Viking longship was built to be similar in the front, the *bow*, and the back, the *stern*. This design allowed the crew to immediately row away from the coast without turning around the ship.

VIKING WARRIORS

Vikings are often pictured as tall, muscular people wearing helmets with horns.

In fact, many Viking helmets were decorated, but they most likely did not have horns. Metal helmets were expensive, and leather caps and shields were a much more common form of defense. Some Vikings also used chain mail shirts, known as **byrnies**, for protection.



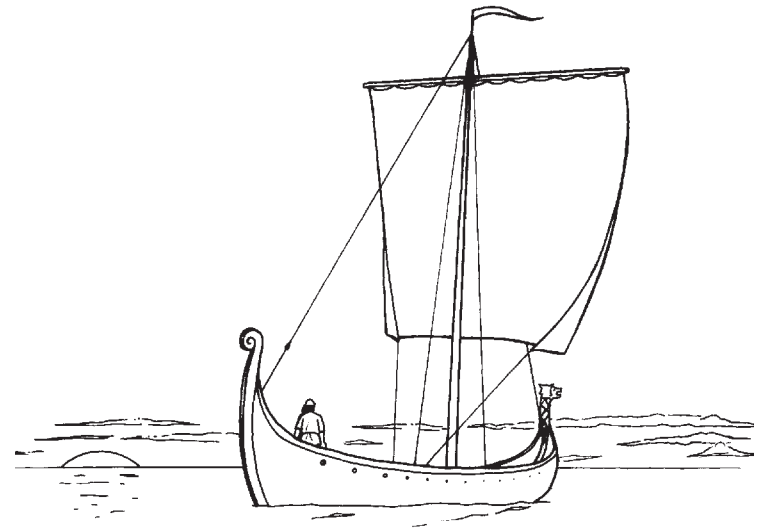
Spears and axes were the most common Viking weapons. Many warriors also used swords, knives, or bows.

Berserkers were special Viking warriors who fought without wearing any armor. They often wore the skins of bears or wolves and fought in a rage so great that they would ignore any wounds they received during battle. The sight of berserkers preparing for battle convinced many opponents to hand over their valuables without a fight. In AD 911 the Frankish king offered an invading Viking army land along the northern coast of France if they would leave the city of Paris alone. That area of France is still known today as Normandy (the “land of the North-men”).

VIKING SHIPS

Each type of Viking ship was built for a different use. Some were built to cross the narrow sea passages, or fjords. Others were used to carry cargo along the trade routes between towns. Larger ships were built to be coastal traders or seagoing warships. Different woods were used in each type of ship. Most Viking warships were made of oak because oak is a very strong wood and also because oak was sacred to their warrior god, Odin.

Their fast ships, called *dragons*, had often a carved dragon’s head high on the bow. The dragon’s head warned others of the mighty warriors aboard these ships.



Viking warships had a shallow **draft**, meaning that the bottom of the ship, or **hull**, wasn't deep. This design allowed the ships to sail in very shallow waters. Because of this feature, Viking ships were not limited to docking in ports and could appear anywhere. They could sail right onto the shore. Warriors could leap from the ship to the beach, ready for battle. The ability to land anywhere along the coast by surprise gave the Vikings a huge advantage in battle. People along the coasts and rivers lived in fear because no one knew where the Vikings might strike next.

Despite their **fearsome** reputation, not all Vikings remained warriors or raiders. Vikings often settled down and stayed in the lands they conquered. They put away their swords to become farmers and traders. They worked hard and lived honestly.

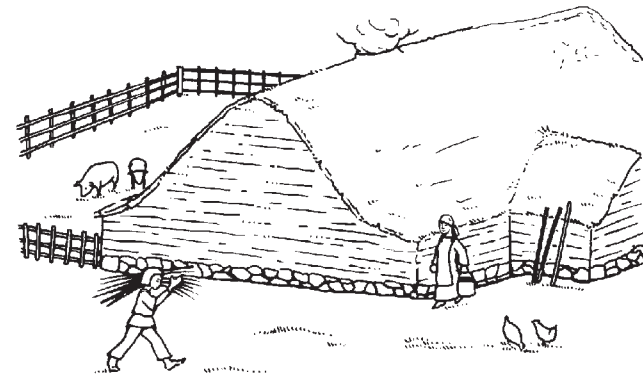
Do You Know?

Many English names for the days of the week come from the Vikings. "Tuesday" comes from "Tyr's day," named after the Norse god of war. "Wednesday" comes from "Woden's Day," after the Norse god Odin. "Thursday" comes from "Thor's Day," named after the Norse god of thunder. "Friday" comes from "Frigg's Day," named after the Norse goddess Frigg.

DISCOVERING A NEW LAND

One brave Viking, Gardard Svavarsson, wanted to find new, unknown lands. He sailed far to the north and west. After many difficult days at sea, the Viking pioneer found a large uninhabited island. Today, the island he discovered is known as Iceland.

Year's later, Iceland's good location attracted another man who was searching for a new home. His name was Folke Vilgerdsson, and he was from Norway. At the time, Norway was ruled by a strict king. The king had little **tolerance** for anyone who did not follow his rules. The king's rules were very demanding, and many people were unhappy. The king feared that some of his subjects might attempt to overthrow him and end his rule. He **banished** Folke and others who wouldn't follow his rules, forcing them to leave Norway forever.



Folke, along with several other **exiled** families, sailed to Iceland. They built a village on the island and, within fifty years, four hundred people lived in this new country.

The new settlers in Iceland created one of the first democracies. In a democratic government, people can vote on ideas, laws, and rulers. The idea or person with the most votes usually wins. Iceland continued to attract strong, brave people who wanted to have a voice in their own lives. The **settlement** was a success. Iceland eventually grew to become one of the happiest and most successful countries in the world.

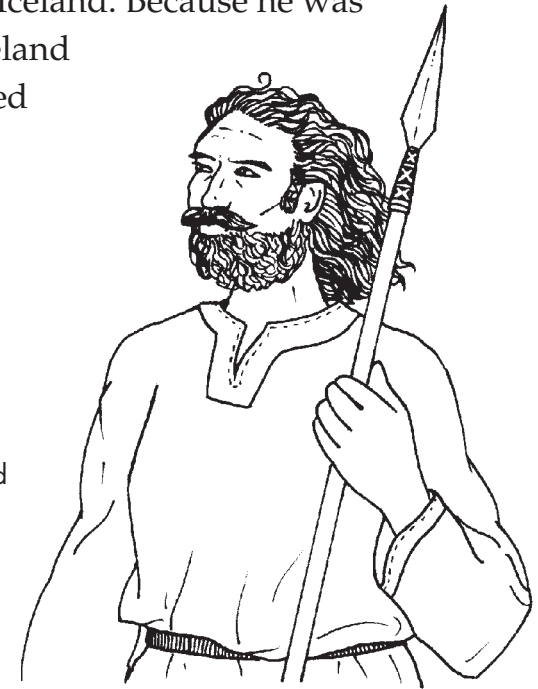


ERIC THE RED

Iceland seemed like an **ideal** place to live, but not everyone fit in there. Most people in Iceland wanted a peaceful life. One **reckless** man, named Eric the Red, found himself in constant trouble with the authorities. He was a bold and hotheaded man who always seemed to be arguing and **brawling** with others. One day he killed three men in a fight. Eventually the officials of Iceland grew tired of dealing with Eric's lawlessness and ordered him to leave.

Eric had heard rumors of a land even farther west than Iceland. Because he was forced to leave Iceland anyway, he decided to set sail for this unknown land, not knowing if it even existed.

Eric the Red was named for his thick red hair.

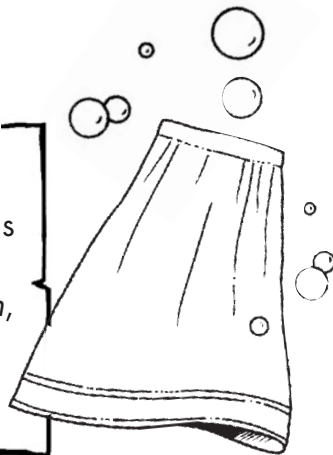


Eric the Red sailed west and found this rumored new land after only two days. He wanted other settlers to come there to start new lives. He told them stories about how green it was. He said it had rich valleys and game animals to hunt. He named this new land he had found *Greenland*.

People believed his stories. The next year, Eric returned to Greenland, leading a group of twenty-five ships filled with people. They expected an easy journey, but the sea was very rough and stormy. Only fourteen of the twenty-five ships reached Greenland safely. The settlers who did arrive built two new communities about 644 kilometers (400 mi) apart. They set up a democratic government like the one in Iceland. Within ten years nearly 3,000 **adventurous** people had come to live in Greenland. Greenland is the world's largest island. Today, about 56,000 people live there.

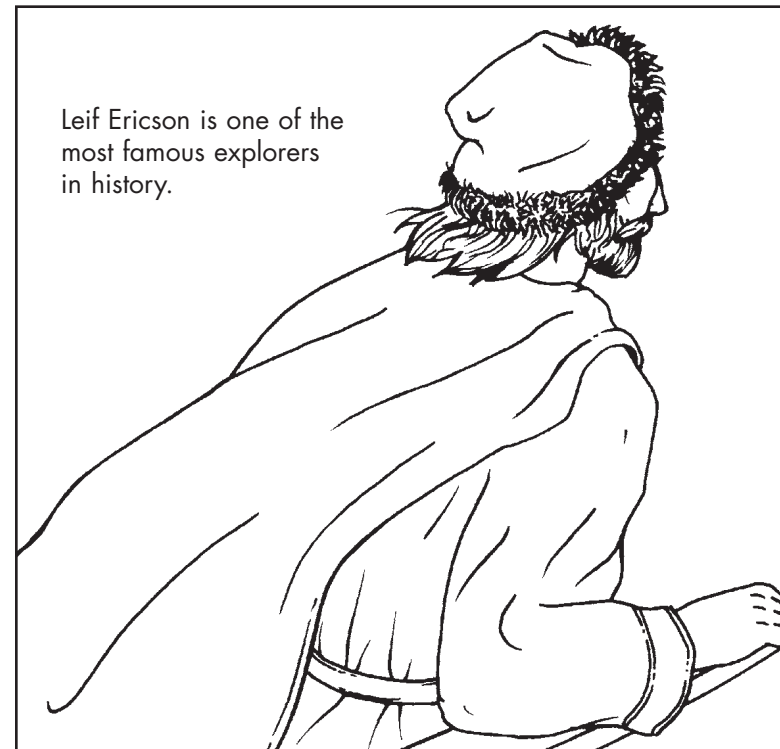
Do You Know?

Nine hundred of the most commonly used words in English come from the Vikings (including *sky*, *skin*, *scrape*, *skirt*, *husband*, *bubble*, and *window*).



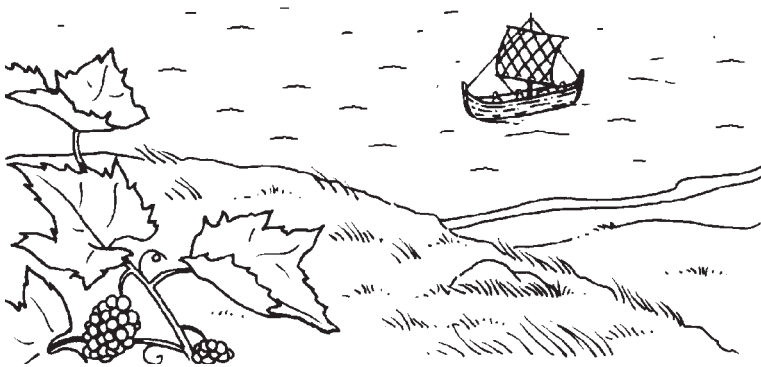
LEIF ERICSON

Perhaps the most famous Viking of all was the second son of Eric the Red. His name was Leif (pronounced *leaf*). In the Viking tradition, because he was "Eric's son," his name became Leif Ericson. Like most Vikings, Leif trained to be a warrior and sailor. Because he was the second son, he wasn't awarded land to farm by his family. He wasn't sure what he wanted to do with his life. Leif decided to sail to Norway, his family's original homeland.



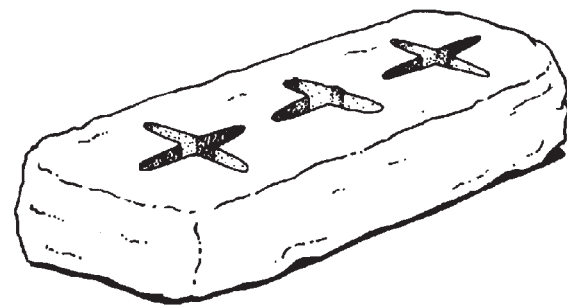
While he was in Norway, Leif heard a remarkable tale told by a trader. The trader's ship had been caught in a terrible storm and blown far off course. While trying to find his way back home, the man had seen a new coast that wasn't on his map. He didn't know exactly where he had been when he saw this coastline, but he described it clearly.

Leif Ericson learned everything he could from the trader about this **uncharted** land. He bought the man's ship. He and a small crew retraced the trader's route, looking for this mysterious coast. Finally, they saw a place that looked like the land of the man's description. They found vines with fruit growing there, so they called it *Vinland*. Today, no one knows exactly where Vinland was. But **archaeologists** have discovered the remains of a small Viking outpost in Newfoundland, Canada, that was settled at about this time.



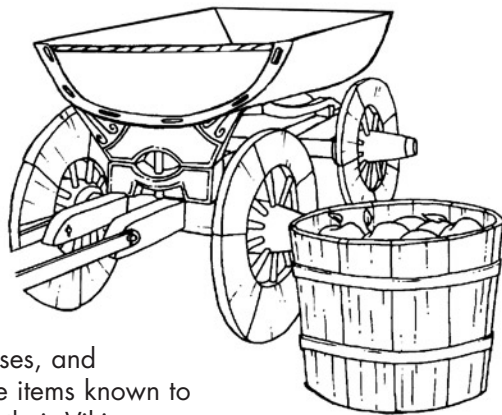
Leif and his crew built a house and spent the winter in Vinland. They sailed home to Greenland the next year. But their adventure was not over. During their return voyage, Leif found a wrecked trading ship and valiantly rescued the crew. As a reward, he was given all the ship's cargo. These adventures earned him the name "Leif the Lucky." Once he returned home, Leif never went on another voyage.

Two years later, Leif's father had died, and Leif was running the family farm. He had no thoughts of sailing again. His younger brother, Thorvald, asked to borrow Leif's ship. He wanted to see for himself this land that Leif had discovered. Thorvald and a crew of thirty sailed along the Vinland coast for two years, exploring the new continent and using Leif's former winter house as a base.



Serving both old and new religions, this stone was used as a mold to make both metal Christian crosses and the pagan Hammer of Thor (the center shape). Thor was a powerful Viking god.

Their explorations in Vinland brought both discovery and sadness. Their arrival frightened members of the native tribes, who had never seen Europeans. Small fights broke out. Then, men from Thorvald's crew killed several native fishermen without reason. A few days later, angry native men **retaliated** by attacking a group of Vikings. The surprised Vikings fought hard but were chased away. Thorvald was wounded, by an arrow. He died of his wound, and his body was buried in Vinland. He became the first European known to have died and been buried in North America. His crew sailed home to Greenland, but other explorers sailed to Vinland over the next three years, including another of Leif's brothers and his sister. Eventually, the Vikings decided that exploring this new land was not worth the trouble it caused, and they **abandoned** the outpost.

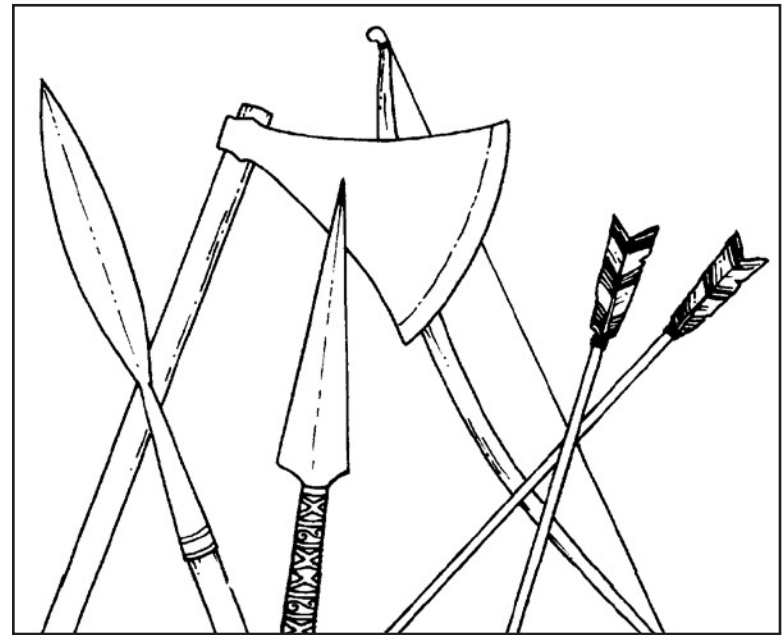


Wagons, furniture, horses, and foods were some of the items known to have been buried with their Viking owners.

OTHER VIKING CONQUESTS

For about 275 years, the Vikings swept across Europe in wave after wave. They were hungry to fight and greedy for riches. They built trade stations along European rivers all the way to the Mediterranean Sea. Viking explorers and raiders even traveled to the Middle East and Asia.

The Vikings were skilled people who could do many things well. They were great warriors, sailors, and explorers. Their conquests left lasting marks on world history. They will always be remembered for their bravery and strength in battle as well as their many explorations.



TIMELINE IN VIKING HISTORY

Year	Events
790s	Viking raids in Europe, including Scotland and Ireland, begin
793	Viking raid on Lindisfarne monastery
844	Viking raids on Spain
845	Conquest of Hamburg and Paris
856–7, 861	Paris conquered by the Vikings
870–930	Norse settlement in Iceland
880s	Harold Finehair attempts to unite Norway
885–6	Siege of Paris
902	Vikings expelled from Dublin
911	Foundation of Normandy by Viking chieftain Rollo
912	Viking raiders on the Caspian Sea
917	Refoundation of Viking Dublin
930	Foundation of the Icelandic Althing
980s	Conversion of Russia
985	Eric the Red settles in Greenland
1000	Iceland converted to Christianity; voyages to Vinland
1066	Battle of Stamford Bridge, Battle of Hastings, Norman conquest of England
1066–87	William the Conqueror, king of England
1091	Norman conquest of Sicily

GLOSSARY

abandoned (<i>v.</i>)	left behind (p. 19)
adventurous (<i>adj.</i>)	having a spirit of adventure; enjoying new challenges and experiences (p. 15)
archaeologists (<i>n.</i>)	people who study ancient cultures (p. 17)
attributes (<i>n.</i>)	characteristics or traits (p. 4)
banished (<i>v.</i>)	forced to leave an area as a punishment (p. 12)
berserkers (<i>n.</i>)	special Viking warriors who wore animal skins and fought recklessly in battle (p. 9)
brawling (<i>v.</i>)	fighting or arguing in a loud, disruptive way (p. 14)
byrnies (<i>n.</i>)	shirts of chain mail worn as defensive armor (p. 9)
chain mail (<i>n.</i>)	flexible armor made from interlinked metal rings (p. 9)
draft (<i>n.</i>)	the depth of water a ship needs to sail without touching the bottom (p. 11)
excelled (<i>v.</i>)	performed extremely well (p. 4)
exiled (<i>v.</i>)	forced to leave one's city or country by political or legal authorities (p. 13)
fearsome (<i>adj.</i>)	causing fear (p. 11)

fjord (<i>n.</i>)	a narrow sea inlet between steep slopes and cliffs (p. 7)
hull (<i>n.</i>)	the main body of a ship or sailing vessel (p. 11)
ideal (<i>adj.</i>)	perfect; couldn't be better (p. 14)
monasteries (<i>n.</i>)	groups of buildings where monks live and worship (p. 8)
pagans (<i>n.</i>)	people who practice religions worshipping many gods or the natural world (p. 8)
plunder (<i>n.</i>)	loot or valuables taken by force (p. 8)
preserved (<i>v.</i>)	maintained or kept in an unchanged condition (p. 6)
reckless (<i>adj.</i>)	lacking caution; careless of consequences (p. 14)
retaliated (<i>v.</i>)	attacked in response to having been attacked (p. 19)
roles (<i>n.</i>)	functions performed as part of a larger effort (p. 4)
settlement (<i>n.</i>)	a new town set up on a frontier where people make a new permanent home (p. 13)
shipwrights (<i>n.</i>)	carpenters skilled at building and repairing ships (p. 4)
tolerance (<i>n.</i>)	the willingness to let others have their own opinions, beliefs, or ways of behaving even if they are not the same as your own (p. 12)
uncharted (<i>adj.</i>)	unknown; not recorded on a map (p. 17)

INDEX

berserkers, 9	Greenland, 5, 15, 18, 19
Christianity, 18, 21	helmets, 9
conquest, 20	Iceland, 5, 6, 12–15
democracies, 13	Nordic people, 6, 7
dragon, 10	Normandy, 9
Eric the Red, 14–16	Norsemen, 6, 7
Ericson, Leif, 16–19	Svavarsson, Gardard, 12
Ericson, Thorvald, 18, 19	Vilgerdsson, Folke, 12
	Vinland, 17–19



Explore More

In which area of the world did the Vikings make the biggest difference?

How would history have been different if the Vikings had permanently settled in Vinland?

In what ways did the Vikings influence other countries?

For Further Research

Chisholm, Jane, Phil Roxbee, Struan Reid, and Phil Roxbee Cox. *Who Were The Vikings?* Usborne Starting Point History Series. London: Usborne, 2002.

Clare, John D., ed. *The Vikings*. Living History Series. New York: Gulliver Green. 1996.

Margeson, Susan. *Viking*. DK Eyewitness Books Series. London: DK Children, 2005.

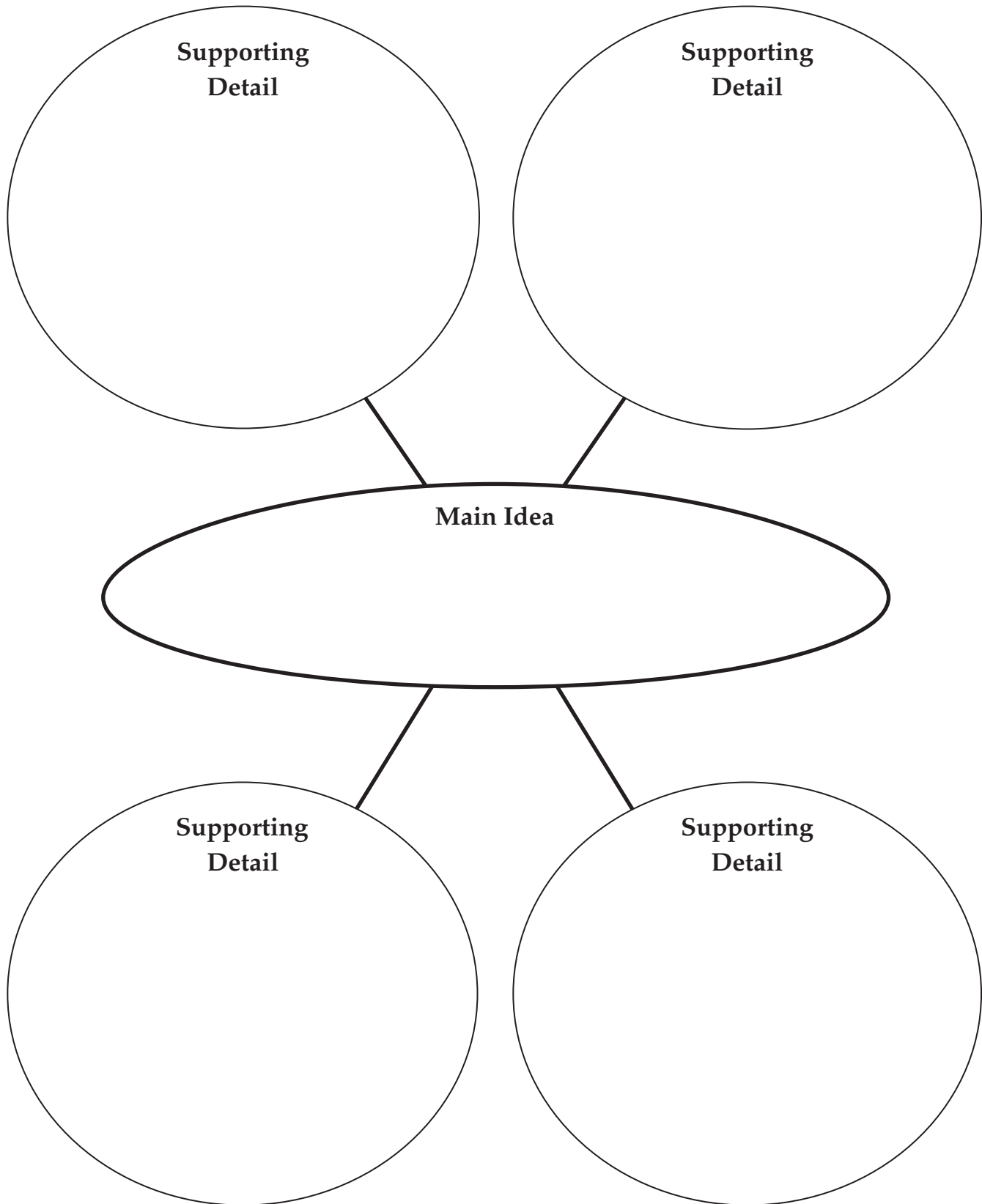
Name _____

Instructions: In the first section, write what you already know about the Vikings. In the second section, write what you would like to learn about them. After you finish reading, fill in the third section with information you learned from reading the book and the fourth section with what you still want to know.

K: What I Know
W: What I Want to Know
L: What I Learned
S: What I Still Want to Know

Name _____

Instructions: Reread the section titled "*Leif Ericson*". Write the main idea in the center of the web. Record the supporting details in the surrounding circles.



Name _____

Instructions: In the text below, circle the letters that should be capitalized. Use a red pencil to circle the letters that should be capitalized as proper nouns. Use a blue pencil to circle the letters that should be capitalized to mark the beginning of a sentence or the name of a chapter.

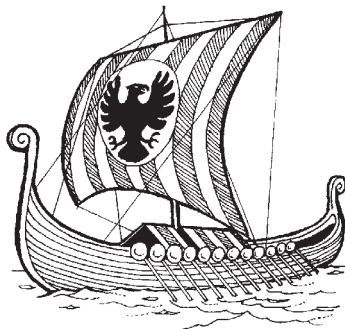
vikings

the great age of the vikings spanned the years between ad 793 and 1066. in that short amount of time, the vikings ranged far from their harsh northern homelands, sailing west to discover iceland, greenland, and north america, long before christopher columbus was even born. seeking riches, they invaded many cities throughout europe, russia, north africa, and even the middle east.

their ships were fast and could carry many warriors. some of their ships even carried horses. using their sailing skills, thirst for adventure, and bravery, the vikings conquered many lands.

people during the viking age called vikings the nordic people, or *norsemen*—men from the north. they were as harsh and rugged as the coastal lands from which they came—lands that we now know as norway, sweden, and denmark. at that early time, all nordic people spoke one language. that language has been almost entirely preserved in the modern-day speech of the people of iceland.

the vikings of denmark headed south. the vikings of sweden went into eastern europe. and the vikings of norway headed west. all of them greatly influenced the lands they invaded and changed the course of history wherever they went.



Instructions: Follow the instructions in each section below.

A. Synonyms

Write synonyms for the following words.

rugged		bigger	
fast		majority	
conquered		rescued	

B. Antonyms

Write antonyms for the following words.

mean		important	
great		older	
surprise		returned	

C. Sentence Construction

Choose four of the words from A and B and use them in a paragraph.



Volcanoes

A Reading A-Z Level Z Leveled Reader

Word Count: 1,756



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Table of Contents

The Eruption of Vesuvius	4
Why and Where Volcanoes Happen	7
Composite Volcanoes	11
Shield Volcanoes	15
Cinder Cones and Lava Domes	17
Conclusion	19
Glossary	20



This volcano shows signs of life.

The Eruption of Vesuvius

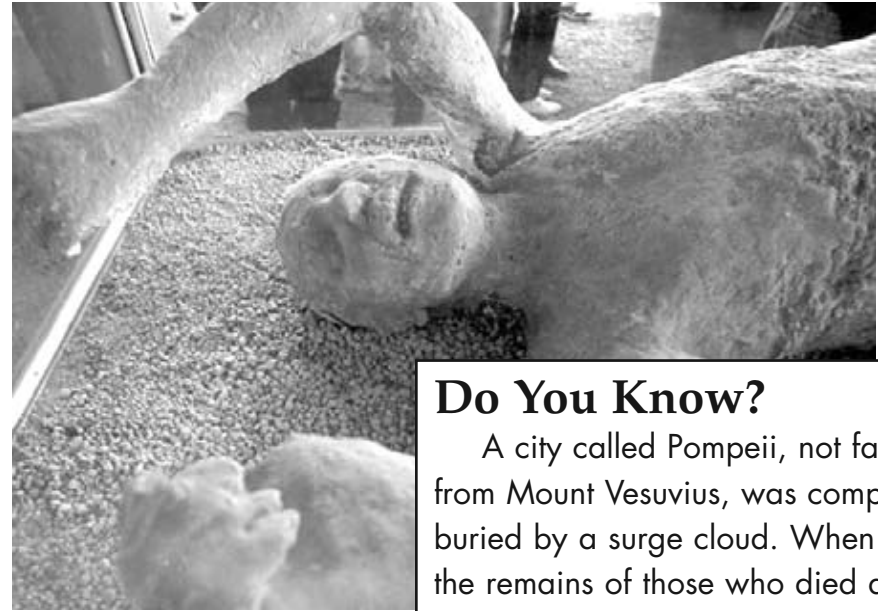
Few people in the city of Pompeii paid much attention to the earthquakes that began shaking the region in AD 79. No one connected them with the stream of smoke that rose from nearby Mount Vesuvius. The slopes of Mount Vesuvius were covered in trees, flowers, and grass. It had been a thousand years since the volcano had erupted, so most people assumed that it was **dormant**, or even **extinct**.

But everything changed on August 24th at around 1 o'clock in the afternoon. Suddenly, a huge explosion shook the area around the mountain. Melted rock, ash, and dust spewed from the top of the volcano, darkening the sky. The dust, ash, and stone began to rain down on the city, covering the ground as far away as 16 kilometers (10 mi) from the mountain.

By 3 o'clock, **lava**, or melted rock, poured from the mouth of the volcano at the rate of 12,000 tons a second, destroying everything in its path. By 6 o'clock, the cloud of dust and ash had risen to a height of 32 kilometers (20 mi), and was so powerful that it created its own lightning. The ash continued to fall over the area, covering the ground to a depth of 1 meter (3.3 ft). Buildings collapsed under the weight of the falling debris.

People in the cities surrounding Mount Vesuvius tried to flee as the volcano demolished their homes and farms. Some people tried to walk over the thick layers of ash, but the ash was so deep and so hot that many people died. Others were struck and killed by pieces of stone falling from the dark sky. Many choked to death on the ash- and dust-clogged air.

Around midnight, the terrible situation became even worse. The massive cloud of ash, poisonous gasses, glowing-hot dust, and smoke had become so tall and heavy that it could no longer stay in the air. The cloud collapsed, falling down the mountain at speeds of up to 500 kilometers per hour (310 mph).



This preserved body of an inhabitant of Pompeii is in a museum. Many others still exist at the actual site of the eruption.

Do You Know?

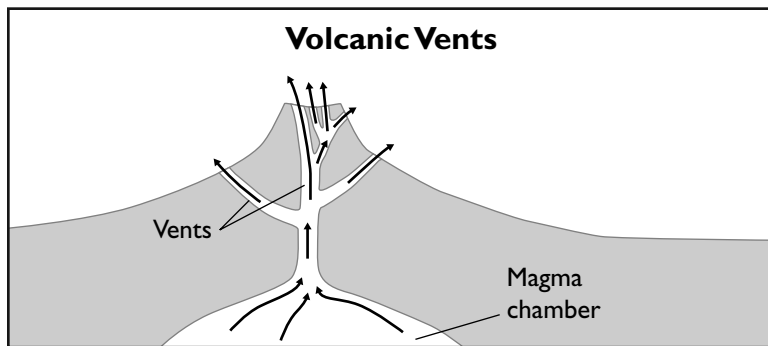
A city called Pompeii, not far from Mount Vesuvius, was completely buried by a surge cloud. When the remains of those who died at Pompeii were eventually found, their bodies were perfectly preserved. The hardened ash and mud acted as a plaster cast, keeping the exact shape of the bodies inside the cast.

This was Mount Vesuvius's first **surge cloud**. Within a few moments, people in the cities of Pompeii and Herculaneum were scorched and buried by the collapsing cloud. As more dust and ash billowed from the volcano, more surge clouds followed. When the eruption was over, two cities of the Roman Empire were completely buried. They would not be found again for over 1,000 years.

What you just read is an account of a real event. But how did it happen? What could cause such a violent explosion? We will look for answers to those questions in this Leveled Reader. But first, we will look at what volcanoes are and why and where they happen.

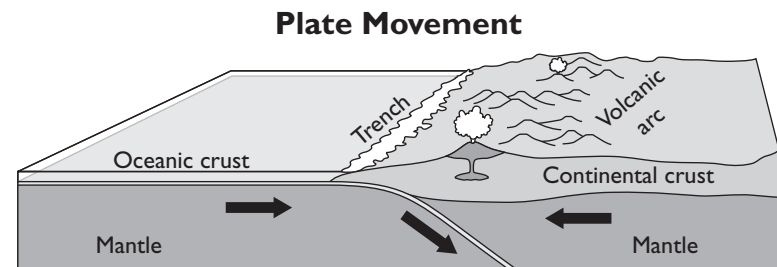
Why and Where Volcanoes Happen

The earth's hard surface, or crust, is made of several enormous sheets of rock called **plates**. Some plates make up the continents, while others make up the ocean floors. Just under the surface of the plates, the earth is extremely hot—so hot that rock melts into a liquid called **magma**. Sometimes, the magma works its way up to the surface and pours out through cracks in the crust. When this happens, we call it a volcano.

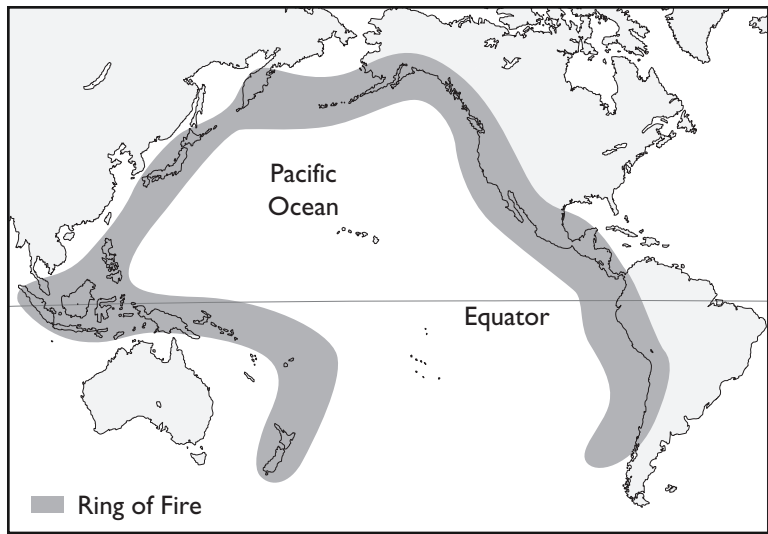


Glowing-hot magma bubbles up inside a volcano.

Volcanoes usually occur at the edges of the plates. The plates are slowly floating on the thick, liquid magma underneath them. But different plates are moving in different directions, and they can crash into, pull away from, or grind past other plates. As these huge plates crash, pull, and grind, the tension and pressure cause large cracks in the crust. This is where the magma usually breaks through, forming a volcano.



When an ocean plate crashes into a continental plate, the ocean plate moves down, creating an active volcanic region.



More than half of the active volcanoes in the world occur in the Ring of Fire.

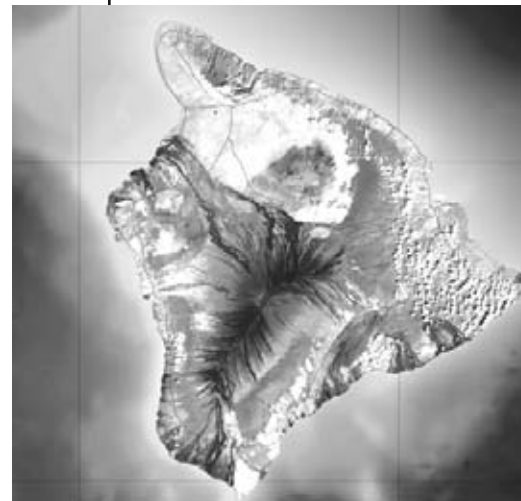
There are at least 500 active volcanoes in the world, and most of them lie near the edges of the plates. The edge of the Pacific Ocean plate is a particularly active volcanic region known as the “Ring of Fire.” Another very active volcanic region is along the Mid-Atlantic Ridge, which is a mountain chain in the Atlantic Ocean. Two plates are pulling apart here, allowing magma to pour into the ocean bottom, where it piles up. Over time, the magma can pile up into mountains so tall that they stick up out of the water. The country of Iceland is made of the tops of large volcanoes in the Mid-Atlantic Ridge.

Some volcanoes are located in areas away from the edges of the plates. The islands of Hawaii are in the center of the Pacific plate. They are above a “hot spot,” a place where hot magma sits very close to the surface of the Earth’s crust. In Yellowstone National Park, in the middle of the North American plate, an underground hot spot sits very close to underground lakes and waterways. The magma heats up the ground and the water, causing geysers and hot springs.

Do You Know?

A “hot spot” created the volcanoes of Hawaii. As the Pacific Plate moves over the top of the hot spot, old volcanoes go extinct and new ones form. It is almost like moving a piece of paper over a

burning candle—the candle makes a row of holes, much like the hot spot makes a row of volcanoes.



A satellite view of the Big Island of Hawaii

Different volcanoes erupt in different ways, depending on where and why the volcano forms. Some volcanoes erupt peacefully and slowly, while others suddenly explode with the force of many atomic bombs. In the next few chapters, we will take a look at different kinds of volcanoes and how they erupt.



Smoke pours from this huge volcanic crater.

Composite Volcanoes

Mount Vesuvius, which you read about earlier in this book, is a **composite volcano** on the west coast of southern Italy. Composite volcanoes are sometimes called explosive volcanoes, because their eruptions can be extremely violent and destructive. They are usually very large mountains with steep sides and evenly shaped peaks, often with a bowl-shaped **crater** at the top. The crater is a hollow area where the magma, hot gasses, and ash come out.

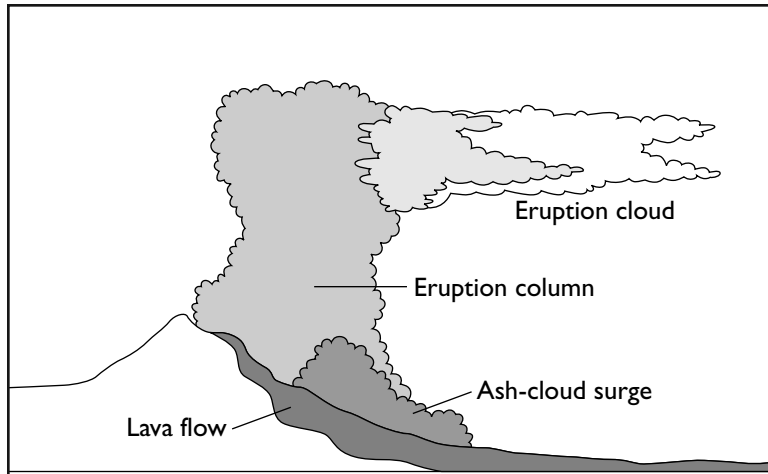
Most composite volcanoes occur where the magma near the surface is very thick and slow moving. Magma moves toward the surface through rocky pipes to openings called **vents**, but when the magma is very thick, it can cool and harden inside the pipe, plugging the vent. The magma below becomes trapped. Heat and gasses within the magma have nowhere to go, and the pressure slowly begins to build. Eventually, the pressure becomes so great that the volcano explodes. Sometimes, the explosion is so violent that the entire mountain can be destroyed. When Mount St. Helens erupted in 1980, the entire northern side of the mountain was blown away.

Do You Know?

When Mount St. Helens, in Washington State, erupted on May 18, 1980, 63 people died and 311 square kilometers (193 sq. mi) of forest were flattened by hot winds that blew down the mountainside.

Mount St. Helens erupting





Dust, ash, and liquid rock pour out of a composite volcano during an eruption.

When composite volcanoes erupt, they send huge clouds of ash, dust, smoke, hot gas, and rock into the air. These clouds rise for many kilometers, turning the sky black and raining ash onto the ground. When the cloud of debris becomes too heavy to stay in the air, it collapses in a violent surge cloud.

Many composite volcanoes are very tall, and they have ice and snow on top. In an instant, the hot explosion can melt all of the snow on the top of the volcano, sending a flood of water, mud, and rock down the mountain at up to 100 kilometers per hour (62 mph).

Some volcanic ash clouds are so large that the ash and dust can travel around the world, blocking out sunlight and cooling down the whole earth. After the eruption of the volcano Tambora in Indonesia in 1815, people as far away as North America had a cold, snowy summer.

Sometimes, an entire underground lake of magma can pour out of a composite volcano, leaving a huge empty space below. The surface collapses into the empty chamber, leaving a large bowl-shaped basin called a **caldera**. Calderas can be as much as 100 kilometers (62 mi) across. Over time, they often fill with water, creating large lakes.



Crater Lake, in the state of Oregon, is a well-known caldera. The small island at the top center of the lake is a cinder cone.

Do You Know?

The Klamath Indians in southern Oregon used to tell a story about the origin of Crater Lake. In the story, the first coyote fell in love with a star and found a way to join her in the sky. When he fell back to Earth, his impact made a hole that became Crater Lake.

Composite volcanoes can destroy huge forests, bury entire cities, and kill thousands of people. These volcanoes are very dangerous because they often remain quiet for hundreds of years before an eruption. People forget that the volcano might explode, and they build their homes dangerously close to the mountain.



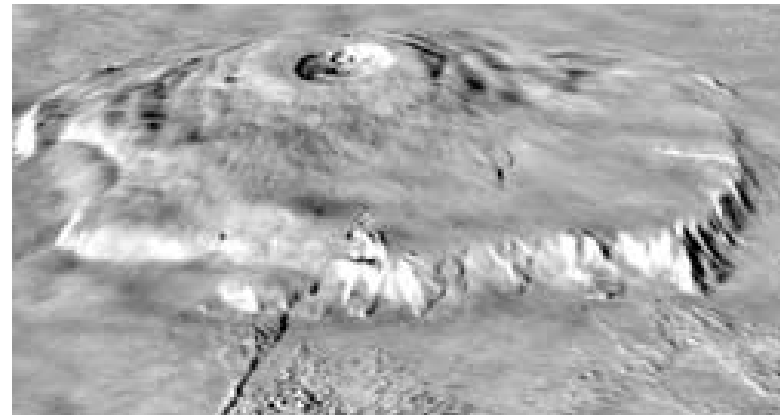
Mauna Loa Volcano, a shield volcano in Hawaii

Shield Volcanoes

You have probably seen video of bright orange lava flowing or spraying from the top of a volcano. The lava is thin and it flows smoothly and quickly. The lava spreads out over the land before slowly hardening and building up. This kind of volcano is called a **shield volcano** because it often creates a gentle, even mountain slope in the shape of a shield.

Shield volcano eruptions are usually gentle rather than explosive, although the lava flows can pour over roads, homes, and forests. Sometimes, the lava in a shield volcano contains hot gasses or steam that sprays from the crater, creating a bright lava fountain.

Shield volcanoes can remain quietly active for a very long time and grow extremely large. Mauna Loa on Hawaii is the tallest volcano in the world, rising 9,170 meters (30,080 ft) from its base on the sea floor, making it taller than Mount Everest. The largest known volcano in the solar system is Olympus Mons on Mars. It is a shield volcano that measures 27 kilometers (17 mi) in height.



Olympus Mons, on the surface of Mars, is the largest volcano in the solar system. It would cover the entire state of Arizona.



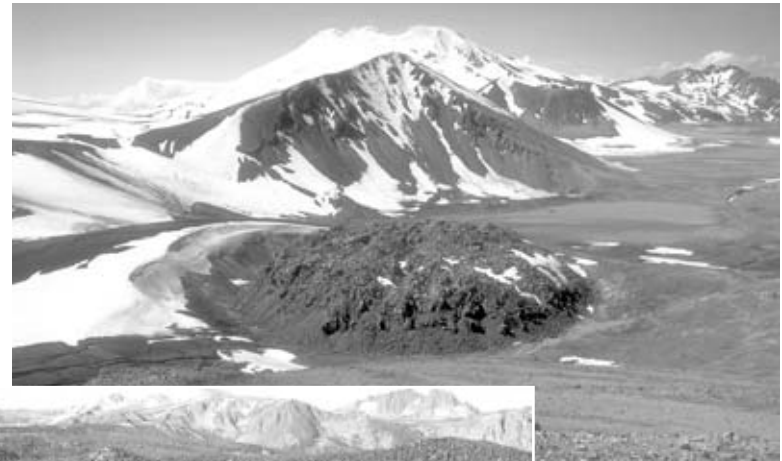
A cinder cone on the flank of Mauna Kea Volcano, Hawaii

Cinder Cones and Lava Domes

Sometimes, volcanoes are not active long enough to form entire mountains. Some volcanoes spray small bits of lava into the air for a short time. As the tiny lava chunks and bits of ash fly through the air, they harden into light, black-colored rocks called **cinders**. The cinders pile up around the vent into a cone-shaped hill with a bowl-shaped crater in the top. These are called cinder cones.

Often, when a brand-new volcano suddenly appears, it forms a cinder cone. Other cinder cones pile up inside the craters or calderas of larger, older volcanoes. Because cinder cones are made of very loose material, they usually erode quickly.

Lava domes also come from small, brief eruptions, but the lava that forms these structures is a thick, pasty liquid that oozes from the vent and quickly hardens. Sometimes, more lava can push up and expand through the center of the dome, cracking the outside. These domes often form in areas where there is other volcanic activity. They can be found in the craters and calderas of larger volcanoes.



Lava dome atop Novarupta vent, Katmai National Park and Preserve, Alaska (above); Wilson Butte lava dome, Long Valley, California (left)



Mount Rainier, a dormant volcano, can be seen from the nearby cities of Seattle and Tacoma in the state of Washington.

Conclusion

Volcanoes are the most spectacular evidence we have that the earth is a changing planet. Lava pouring from a volcanic vent creates new rock and new land. Volcanic ash makes extremely fertile soil that is wonderful for farming. In some places, people use the heat from volcanoes to run power plants and make electricity. And volcanic mountains, including Mount Fuji in Japan, Mount Rainier in Washington State, and Mauna Loa in Hawaii, are some of the most recognizable and beautiful mountains in the world. It is no wonder that humans often choose to live near volcanoes. But we should always remember that volcanoes can be violent, dangerous places. Volcanoes unleash some of the most powerful forces from within the earth.

Glossary

caldra (<i>n.</i>)	a large, bowl-shaped basin where the land has collapsed into an empty magma chamber (p. 14)
cinders (<i>n.</i>)	light, black-colored rocks or pebbles formed by small pieces of flying lava and ash (p. 17)
composite volcano (<i>n.</i>)	an explosive volcano made of different layers of ash and lava (p. 11)
crater (<i>n.</i>)	a bowl-shaped hollow area in a volcano where lava, ash, and gasses come out (p. 11)
dormant (<i>adj.</i>)	quiet for many hundreds of years (p. 4)
extinct (<i>adj.</i>)	has not erupted in thousands of years and shows no sign of future eruptions (p. 4)
lava (<i>n.</i>)	melted, liquid rock on the surface of the earth (p. 5)
magma (<i>n.</i>)	melted, liquid rock beneath the surface of the earth (p. 7)
plates (<i>n.</i>)	the large sheets of rock that make up the earth's crust (p. 7)
shield volcano (<i>n.</i>)	a non-explosive volcano made of hardened lava (p. 15)
surge cloud (<i>n.</i>)	a fast, superheated cloud of ash, gas, dust, and rock that moves along the ground (p. 6)
vents (<i>n.</i>)	openings in Earth's crust through which magma and gasses emerge (p. 12)

Name _____

INSTRUCTIONS: Write information about the following volcanoes. Include physical descriptions, events, dates, and any information that applies. Some will have fewer details available than others. You may need to do research in the library or online. Remember to write the information in your own words.

Mount Vesuvius

Mount St. Helens

The Hawaiian Islands

Wizard Island, Crater Lake

Mount Etna

Name _____

INSTRUCTIONS: Follow the instructions in each section below.

A. Prefixes and Suffixes

Circle the prefix or suffix in each word. Write a sentence explaining how each prefix or suffix has changed the meaning of the word.

remake _____

overdone _____

preview _____

unkind _____

nonsense _____

walked _____

reasonable _____

B. Root Words

Find and write the meaning of the following words from the *-ology* word family. You may need a dictionary to help.

Genealogy _____

Cosmology _____

Astrology _____

Meteorology _____

Ornithology _____

Seismology _____

Psychology _____

Biology _____

Name _____

INSTRUCTIONS: Using a complete sentence, give a detailed answer to each question below for each celebrity.

	Albert Einstein	Gloria Estefan	Dikembe Mutombo
Was this person exiled from his or her homeland?			
Did this person immigrate to the United States?			
Was this person a victim of oppression?			
Did this person come from a poor family?			
Has this person's career benefited other people?			

Name _____

INSTRUCTIONS: Follow the instructions in each section below.

A. Decide whether each phrase from the book refers to **when** or **where** the action took place.
Circle the heading that refers to either time or location.

for centuries before Einstein's time	When?	or	Where?
on a train	When?	or	Where?
while their mother worked days	When?	or	Where?
until she was 16	When?	or	Where?
in Havana	When?	or	Where?
in one of the poorest neighborhoods	When?	or	Where?
after signing with Atlanta	When?	or	Where?
when Atlanta traded him	When?	or	Where?

B. Find three more phrases that refer to time or location from *Success Stories*. Write your new phrases below, and circle whether each one refers to **when** or **where**.

_____	When?	or	Where?

_____	When?	or	Where?

_____	When?	or	Where?

C. Write your own phrases. Circle whether each one refers to **when** or **where**.

_____	When?	or	Where?

_____	When?	or	Where?

Success Stories

A Reading A-Z Level Z Leveled Reader

Word Count: 2,678

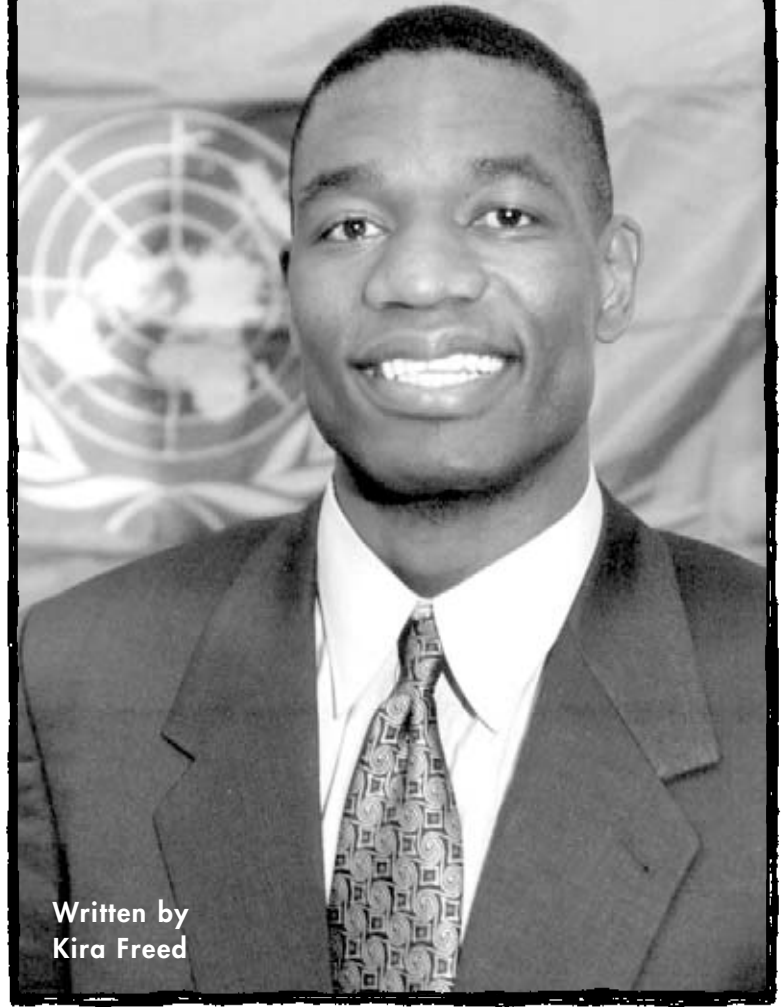


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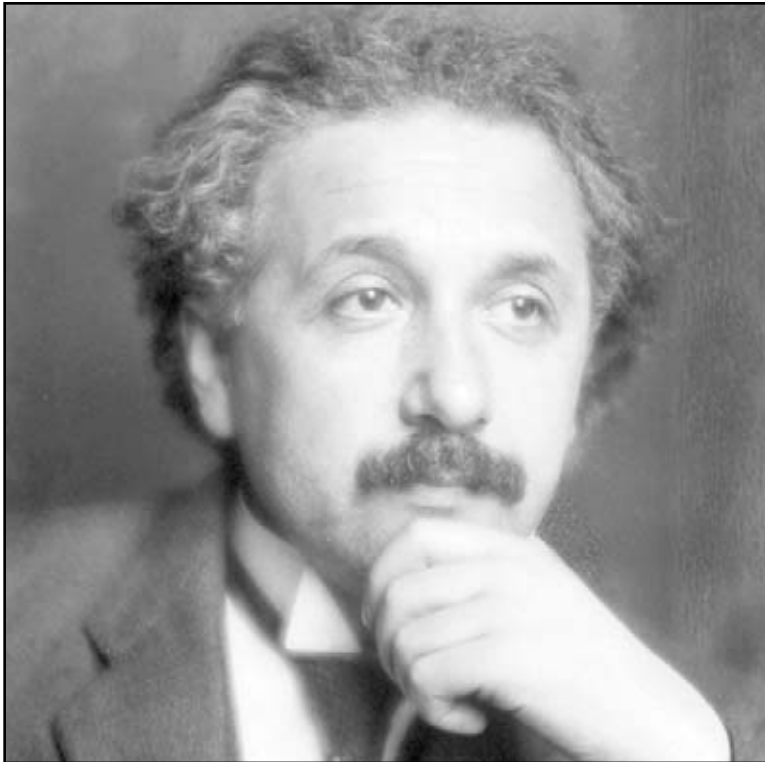
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Table of Contents

Gloria Estefan	5
Dikembe Mutombo	9
Albert Einstein.....	14
Explore More	23
Glossary	24

The three people featured in this Leveled Reader—Gloria Estefan, Dikembe Mutombo, and Albert Einstein—are all immigrants who moved to the United States. The circumstances that caused them to leave their countries of origin are very different, as are the areas in which they became influential. Yet their stories have two common threads: remarkable success and a strong commitment to making a contribution toward the betterment of humanity.



Gloria Estefan performs on an American television show in 2001. Her shirt reads "Cuba, B.C."—Cuba Before Castro.

Gloria Estefan

Gloria Estefan (Gloria Maria Milagrosa Fajardo at birth) was born in Havana, Cuba, on September 1, 1957. When she was 16 months old, her family fled the Communist government of **dictator** Fidel Castro and moved to Miami, Florida. She and her mother lived in a Miami **ghetto**.

Her father, who had been a Cuban soldier, was involved in the 1961 Bay of Pigs invasion, which was an unsuccessful attempt by Cuban **exiles**, backed by the United States government, to overthrow the Cuban government. Gloria's father was captured and imprisoned in Cuba for 18 months. After his release, he moved his family to Texas. Later he served in Vietnam for two years, after which the family returned to Miami in 1968.

Gloria grew up with the responsibilities of a caretaker on her shoulders. She took care of her younger sister, Rebecca, while their mother worked days and attended school at night, and she also took care of her father after he was diagnosed with multiple sclerosis. Doctors thought his illness might be connected to a toxic chemical called Agent Orange that he was exposed to while serving in the military during the Vietnam War. The chemical was used to destroy trees and shrubs where enemy soldiers were hiding, and as a result, American soldiers were also exposed to it. Gloria cared for her father after school until she was 16, when he entered a veterans' hospital. During those long years of caretaking, Gloria took **refuge** in playing the guitar and singing in her room.

She entered the University of Miami in 1975 on a partial scholarship to study psychology and completed a bachelor's degree in 1978. Although she loved music, she was incredibly shy and could not imagine herself performing in public. One day her mother took her to a Cuban wedding where she met her future husband, Emilio Estefan, and his Cuban-American band, the Miami Latin Boys. Before long, she became an accompanist and occasional lead singer of the band.

Emilio—the group's leader and keyboard player—helped Gloria to break through her shyness. Over time, she began to sing more often and to add her own pop songs to the group's **repertoire**. The group, eventually renamed Miami Sound Machine, began releasing albums, and starting in 1984 their success began to skyrocket. At first they were exclusively a Hispanic group, but they soon became popular with a widely mixed audience that enjoyed pop, dance, soul, and Latin music. As the group became more popular, it was called Gloria Estefan and the Miami Sound Machine (to highlight her importance in the group) and eventually just Gloria Estefan.

In 1989, Gloria released her first solo album, "Cuts Both Ways." A year later, she was in a very serious accident when a semi truck collided with her tour bus. She broke her back and was not expected to recover fully, but with great determination and hard work in physical therapy, she did recover. The shower of love from her many fans helped to keep her spirit strong.

She celebrated her recovery with the release of the album "Into the Light" and a year-long



Gloria Estefan leads a group of Latino recording artists during an event at the White House on October 12, 2001, celebrating National Hispanic Heritage Month.

tour. She wanted to give something back to all the people who had cared about her after the accident. In 1992, she organized a benefit concert and raised three million dollars for the victims of Hurricane Andrew.

Many successes, honors, and awards marked the following years. She was chosen to sing in the closing ceremonies of the 1996 Olympic Games in Atlanta. She also took up acting, beginning with *Music of the Heart* with Meryl Streep. She was also in a made-for-TV film, *The Arturo Sandoval Story*. She hopes to do more acting in the future.

Now, more than ten years after the accident, she is one of the most successful entertainers in the world. Her concerts are sold out, and her records sell by the millions. Her life has been strongly shaped by her family's roots as Cuban exiles, and she continues to speak out against the **tyranny** of Castro's government. Like many other exiled people around the world, she fiercely defends her culture's traditions while condemning the oppression that drove her family from their homeland. Her music and her life reflect her Cuban roots and her American upbringing, and she continues to attract an audience of millions from both cultures.



Dikembe Mutombo (left) and Tyrone Hill (right) hold the trophy presented to the Philadelphia 76ers in 2001 when they defeated the Milwaukee Bucks to win the NBA Eastern Conference Finals.

Dikembe Mutombo

Dikembe Mutombo was born in the Democratic Republic of the Congo (formerly called Zaire), in one of the poorest neighborhoods in the capital city of Kinshasa. He knows firsthand what it is like to be poor. Good fortune and talent led him to an amazingly successful basketball career in the United States. He promised to use his success to help children around the world who are trapped in poverty.

He came to the United States to attend Georgetown University in Washington, D.C., on a scholarship. At the time, he planned to become a medical doctor and return to his country to practice medicine. However, in his second year, the university's basketball coach convinced Mutombo to join the team because of his 7'2" height. After joining the team, he changed his academic goals and ended up graduating in 1991 with degrees in linguistics (the study of language) and diplomacy (the study of relations between nations). He speaks four languages and five African dialects **fluently**.

Mutombo's career with the National Basketball Association (NBA) began in 1991. He was chosen to play for the Denver Nuggets after graduating from college. The eighth-ranked Nuggets beat the top team, the Seattle Sonics, in one of the most surprising playoff upsets ever.

He later signed a contract to play for the Atlanta Hawks. After joining the Hawks, Mutombo blossomed into the league's most dominant defensive player. He regularly led in blocked shots and also became one of the best rebounders. He won three Defensive Player of the Year awards. But what he really craved was a chance to win a championship.

When Atlanta traded him to the Philadelphia 76ers in 2001, he finally had that chance. He collected his fourth Defensive Player of the Year award in 2001, and during that year his team reached the NBA finals against the Los Angeles Lakers. Although Mutombo's team played well, the Lakers won the title. Mutombo's career is far from over, however, and his talents will probably give his team another chance at a title.

In addition to being a star basketball player, Mutombo is involved in many **humanitarian** projects in the United States, in the Congo, and around the world. In the U.S., he has been involved with an NBA program called Strong STARTS (Strong Schools Taking Action to Reach Troubled Students), a program that helps teens with emotional problems to succeed in school. While playing for the Atlanta Hawks, he was involved in their Team Up program, which encourages students to get involved in community service, such as working in soup kitchens and homes for senior citizens.

In 1997, Mutombo established the Dikembe Mutombo Foundation. Its purpose is to improve conditions in his native country, the Congo. Children there die every day from illnesses that are prevented in countries with widespread

immunization programs. Mutombo has worked to educate people in the Congo about the importance of immunization. One of the foundation's major projects is the construction of a new hospital in Kinshasa. Mutombo has donated \$3 million of his own money and is working to raise more to complete the project. In addition to improving medical care, his foundation's goals include education and overall improvement of quality of life.



Dikembe Mutombo, actor Danny Glover, and 11-year-old Nkosi Johnson in 2000 at the 13th International Conference on HIV/AIDS in South Africa. Nkosi, an AIDS orphan who later passed away, was the inspiration for the creation of Nkosi's Haven, the first and only care center in South Africa for HIV/AIDS-infected mothers and their children.

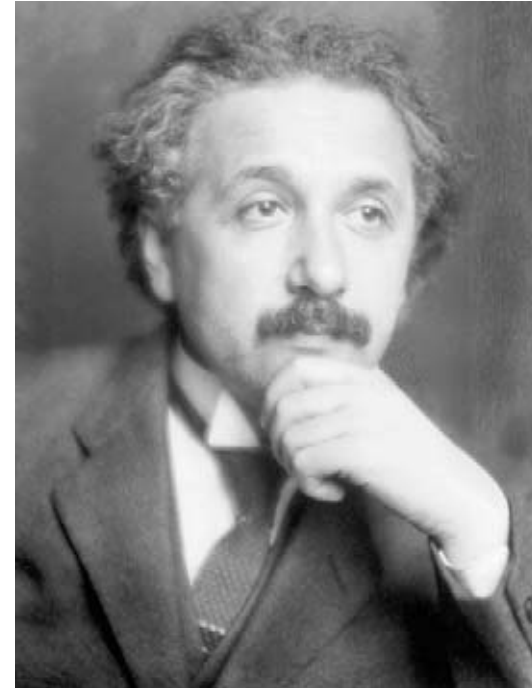


Dikembe Mutombo in 1999 in Kinshasa at a wheelchair basketball event to kick off the polio eradication campaign in the Congo.

He has traveled all over Africa teaching free basketball clinics and donating uniforms

and equipment for teams. He provided funding and uniforms that allowed the Congo's women's basketball team to attend the 1996 Olympic Games in Atlanta.

In 1999, Mutombo was named the first Youth Emissary for the United Nations Development Program. He is working to enlist young people around the world in the fight against poverty. He has also toured Africa twice as a spokesperson for CARE, one of the world's largest organizations working to end poverty. Mutombo is a shining example of an immigrant who has used his good fortune and opportunities to give something back to his country and to the rest of the world.



Albert Einstein

How would you like to be so famous for your intelligence that when people hear the word "genius," they think of you? That's what happened to Albert Einstein. Many of his schoolteachers disliked him and thought he had no potential. Yet he became famous around the globe, and his ideas changed how we understand the world of physics—the science of matter, energy, motion, and force. He is also famous for his wild hair and, more importantly, for his passionate beliefs about world peace.

Einstein was born in Germany on March 14, 1879, to a Jewish family that owned a small shop that manufactured electrical equipment. While most children were talking by the age of two, Albert didn't begin talking until he was three. And when he entered school, he did not do well. He disliked the structure and routine imposed on students in the German schools. He found schoolwork dull and boring, and he showed little interest in classroom learning. Still, he was quick to grasp mathematics and taught himself difficult math concepts even before entering secondary school.

After several business failures, Einstein's family left Germany for Italy when Albert was 15 years old. He stayed behind in Germany but left after failing an entrance exam to a technical school where he had hoped to study to become an electrical engineer. He joined his family in Italy for a year and later completed his secondary education in Switzerland. He went on to a Swiss college and completed a program that certified him to teach math and physics. However, he was unpopular with his professors, who refused to recommend him for a teaching position.



The European countries where Einstein lived are shown in white.

The late 1800s were a time of many negative prejudices, feelings, and actions against Jewish people. These attitudes, called **anti-Semitism**, were especially strong in Germany. Like many people who **emigrate** to escape **religious oppression**, Einstein left Germany because of the strong climate of anti-Semitism. In 1900, he became a citizen of Switzerland.

In 1902, Einstein got a job in a Swiss patent office where he worked for seven years. He spent his free time studying physics and playing the violin. In 1905, he earned a Ph.D. in physics from the University of Zürich. During those years, he published many professional papers on physics. His unpopular ideas were not accepted by his colleagues until experiments later proved them correct. Because Einstein's ideas were ahead of his time, few people understood them, and few people understand them today. Yet he went on to become a famous physicist and developed new thinking about how matter and energy behave.

Einstein studied many things related to physics. Before Einstein, ideas about atoms were based mainly on **speculation**. Einstein used mathematics to prove the existence of atoms. He also showed how the energy from light turns into electrical energy when it hits certain metals. For centuries before Einstein's time, scientists had disagreed about the nature of light. His work allowed them to move forward in their understanding of how these principles work.

One of Einstein's most famous theories was about how the rate of motion of an observer affects the measurement of time. For example, imagine you are on a train traveling at 60 miles per hour. You toss a ball to your brother at a speed of 15 miles per hour. To both of you, the speed of the ball will be just that—15 miles per hour. But to your mom and dad, who are on the platform at the train station, the speed of the ball's movement is the speed of the toss (15 miles per hour) plus the speed of the train (60 miles per hour), for a total of 75 miles per hour.

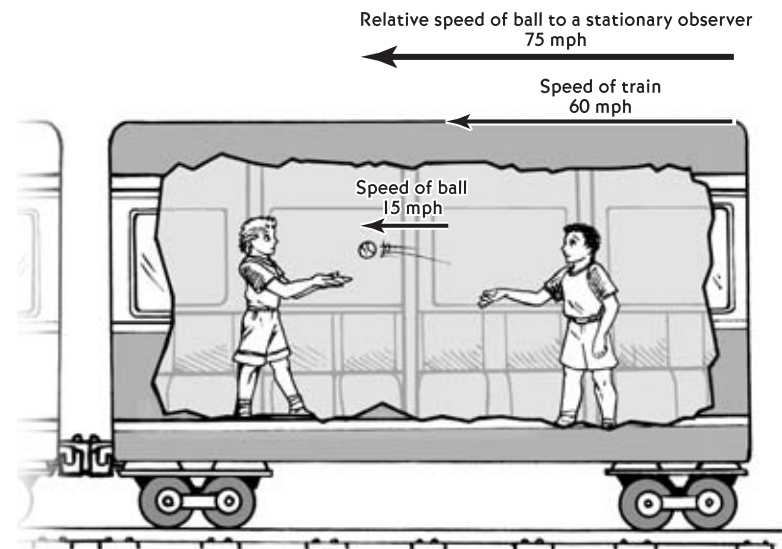


Illustration of how the ball's speed is different depending on whether the observer is inside or outside the train.

This idea led Einstein to many other ideas about light, speed, and motion. These ideas are too numerous and too complicated for this Levelled Reader (see Explore More on page 23), but his work revised earlier ideas about motion and time that had been around for centuries. It introduced, and proved, many ideas about motion and time being relative—that is, that they are not constant in all circumstances.

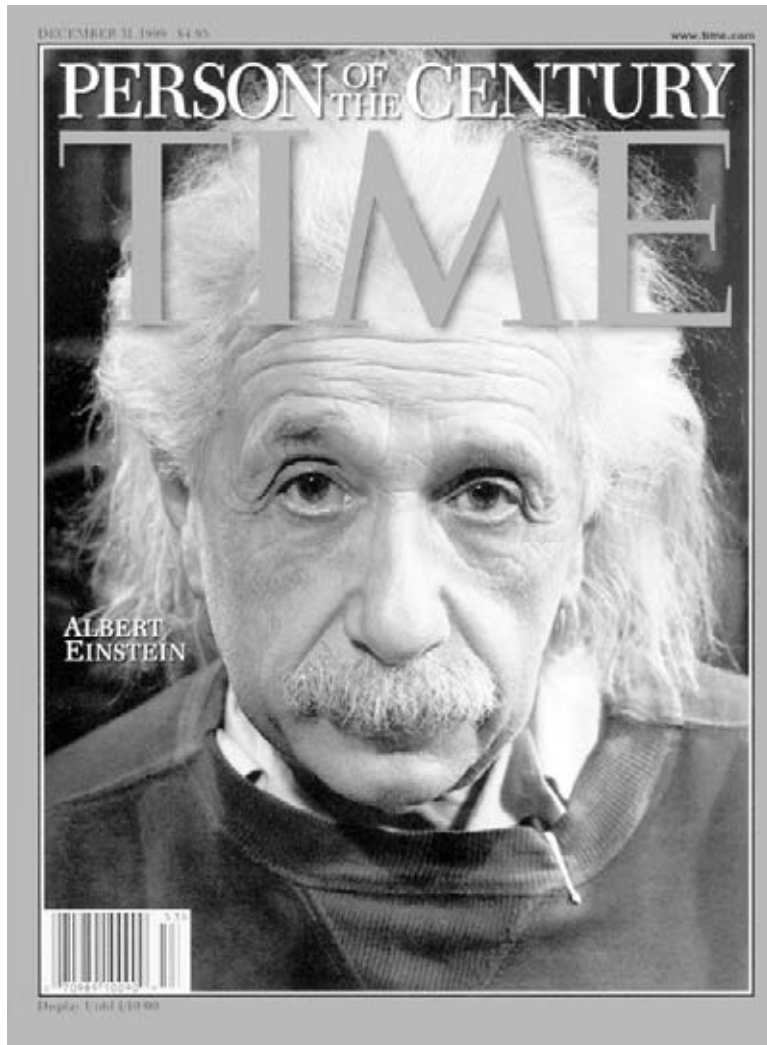
In addition to these ideas about relativity, Einstein is perhaps best known for his famous equation $E = mc^2$. E is energy, m is mass (or matter), c is the speed of light, and c^2 means “ c squared” or c multiplied times itself. This equation means that a tiny amount of matter can be converted into a huge amount of energy. This is the basis for how nuclear power works—a tiny amount of radioactive fuel such as uranium is converted into an enormous amount of heat energy.

These and other ideas brought Einstein fame in the scientific world. In 1909, he began the first of several teaching positions at universities in Europe. He was given many honors and awards, including the Nobel Prize in physics in 1922. Einstein eventually returned to Germany to work in a physics institute and stayed until Adolf

Hitler came to power. He disagreed with Hitler’s social and political beliefs and, once again, he emigrated. Einstein moved to the United States at the end of 1932 and taught at Princeton University. A month later, the Nazis came to power in Germany. Einstein knew he would be in danger if he returned to Germany because of his religious and political beliefs, so he never went back. He became a permanent resident of the United States in 1935 and a citizen in 1940.

Einstein’s theories about matter and energy helped lead the way to the development of the atomic bomb. Along with several other scientists, he wrote a letter to U.S. President Franklin Roosevelt asking the government to support the development of the atomic bomb. While Einstein was a peace **advocate**, he was afraid that Germany, under Hitler, would develop an atomic bomb first. Although he did not work on the bomb himself, the United States did develop it. Dropping the bomb helped to bring World War II to an end.

In addition to his great love of physics, Einstein was a passionate supporter of peace and **disarmament**. During World War I, he was one of the few German scholars who spoke out against Germany’s involvement in the war. After the war,



Albert Einstein was chosen "Person of the Century" by *Time Magazine* at the end of 1999.

he was criticized harshly for his pacifist (peaceful) values.

After World War II, Einstein promoted international disarmament. He strongly believed that every nation should give up nuclear weapons. He also supported the right of the Jewish people to have a homeland and spoke out in favor of the establishment of Israel as a homeland for the Jewish people. While Einstein did not enjoy his fame, he discovered that people wanted to hear what he had to say. So he made many speeches and shared his beliefs outspokenly.

Einstein died on April 18, 1955, in Princeton, New Jersey, at the age of 76. One of his **legacies** was the demonstration, through his own example, that one needn't be a genius in every area of life to make significant contributions. He did not speak until the age of three, failed a school entrance exam, did not excel in college, and was so absentminded that he had difficulty remembering his own address. Yet despite these shortcomings, he made enormous contributions to the understanding of how the physical world works. For those contributions, and for his vision of a peaceful world, he deserves the recognition and respect he has earned.

Explore More

On the Web

In the address window, type: *www.google.com*

Then type: *Gloria Estefan*. Click on “Google Search.”

- Read the colored links. Click on one that looks interesting.
- To explore other links, click the “back” arrow on the top left until you get back to the page with the links that Google found.
- Then try searching using other words from this Leveled Reader, such as: *Dikembe Mutombo*, *Albert Einstein*, *disarmament*, *CARE*, or *Bay of Pigs Invasion*.

Books about Albert Einstein

Goldenstern, Joyce. *Albert Einstein: Physicist and Genius*. Berkeley Heights, NJ: Enslow Publishers, Inc., 1995.

McPherson, Stephanie Sammartino. *Ordinary Genius: The Story of Albert Einstein*. Minneapolis, Minn.: Carolrhoda Books, Inc., 1995.

Parker, Steve. *Albert Einstein and Relativity*. New York: Chelsea House Publishers, 1994.

Glossary

advocate	a person who speaks or writes in support of a particular cause (p. 20)
anti-Semitism	prejudice or discrimination against Jews (p.16)
dictator	a ruler with absolute power, especially one who rules tyrannically (see <i>tyranny</i>) (p. 4)
disarmament	the reduction of armed forces and weapons (p. 20)
emigrate	to leave a country to settle elsewhere (p. 16)
exiles	people forced to leave their country of origin, either because conditions are horrible or because the government has sent them away (p. 5)
fluently	speaking and writing a language easily, smoothly, and expressively (p. 10)
ghetto	a section of a city where many members of a minority live, usually in poverty (p. 4)
humanitarian	devoted to promoting the welfare of humanity, especially by eliminating pain and suffering (p. 11)
immunization	inoculating or vaccinating against a disease (p. 12)
legacies	anything handed down by someone upon their death, such as money, property, or a message to humanity (p. 24)
refuge	a place of safety, comfort, or protection (p. 5)
religious oppression	the unjust treatment of a particular religious group (p. 16)
repertoire	the collection of songs, roles, plays, or operas that a group knows and can perform (p. 6)
speculation	based on ideas and theories, but not proven (p. 17)
tyranny	oppressive and unjust government; cruel and unjust use of power or authority (p. 8)

Genetics at Work

A Reading A-Z Level Z Leveled Reader

Word Count: 1,922

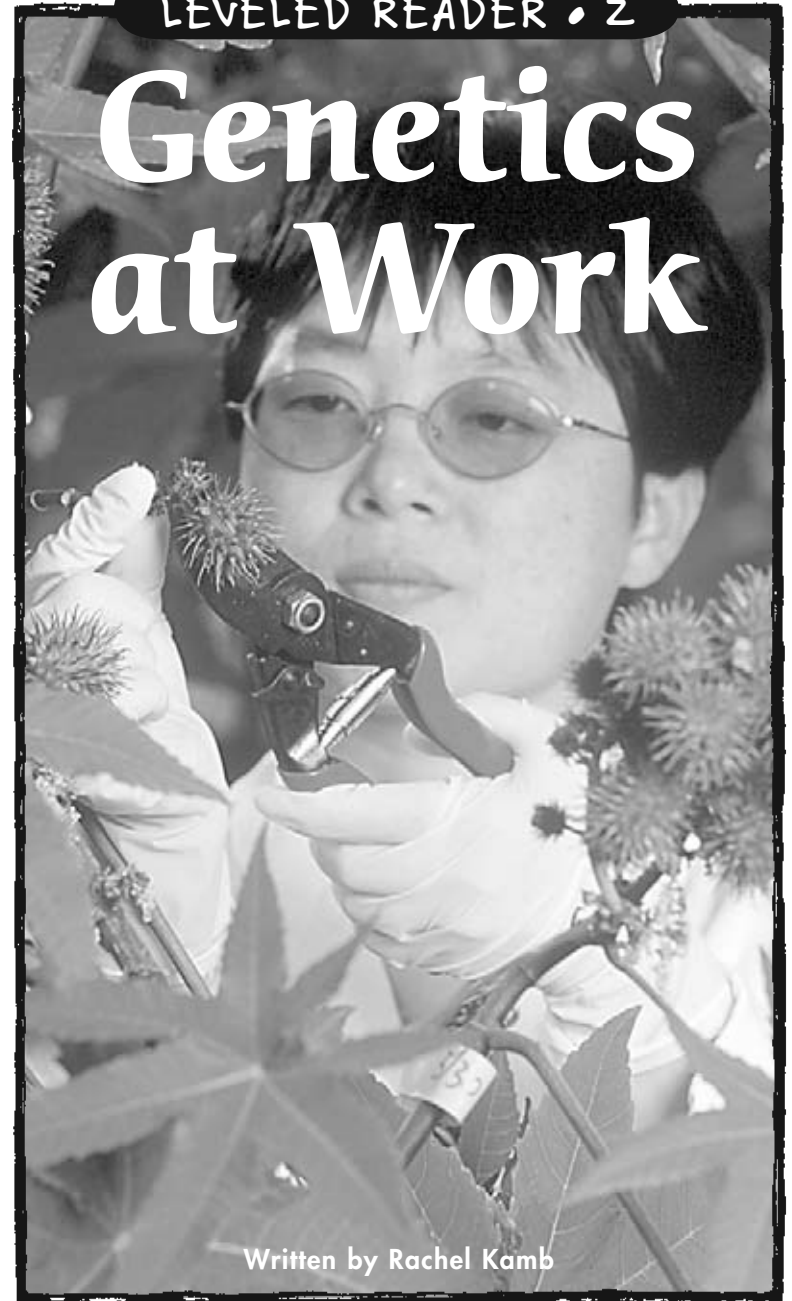



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Cover: A biologist examines genetically altered castor beans.

Back cover: Ears of corn show the variety of traits produced by genetic diversity.

Title page: Medical scientists are working on growing crops containing vaccines that prevent disease.

Genetics at Work
Level Z Leveled Reader
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Table of Contents

Introduction	4
Farming	6
Animal Breeding	10
Animals in Zoos	14
Solving Crimes	17
Health	21
Conclusion	22
Explore More	23
Glossary	24

Introduction

Do you sometimes wonder what you want to be when you grow up? Have you ever thought about being a doctor or a detective? Or maybe you want to work with animals on a farm or in a zoo, or raise your own dogs. There is one thing you may not have thought about that all these jobs have in common . . . **genetics!**



Doctors use genetics more and more every day.

What is genetics? Think about all the members of your family. Do you notice any similarities? Maybe you all have the same color hair, or maybe some of you have long fingers or small noses. Things like hair color and the shape of your body are traits that can be passed down from your grandparents to your parents to you, and so on. So when someone says you **inherited** your eyes from your mother, they mean your mom passed that trait down to you.

Family members look alike because they share the same inherited traits.



Genetics is the field of science that studies how all living things pass on these traits. These traits are passed on through **genes**. Genes are units of heredity that determine traits.

You may be wondering what being a detective and raising dogs have to do with genetics. You will soon find out that genetics has a lot to do with these jobs and others, such as farming, animal breeding, curing diseases, preventing potential illnesses, solving crimes, and more.

Farming

Although genetics is a new science, there is evidence of people using genetic techniques to create better crops and animals as early as 5000 B.C. Many of these simple techniques are still used today.

Selective breeding is one of these techniques. This is when scientists select plants with characteristics they like, such as fast-growing or good-looking fruit, to breed with other plants that have those same characteristics or other desirable characteristics. By selectively breeding these plants, scientists ensure the plants' good traits are passed on to create crops that grow faster and produce better fruit, or have other characteristics they like.



Most of the foods we eat have been genetically modified, either through breeding or technology.



Dozens of varieties of tomatoes have been bred from a single wild variety.

Think about the many types of tomatoes you can buy at the supermarket. These varieties are the result of the selective breeding of tomato plants. Some common characteristics that scientists try to **propagate** are faster-growing and more plentiful crops, better color and taste, durability, and resistance to disease. Wheat, soybeans, and corn are other common crops that are grown using genetic techniques.

In the future, scientists hope to have even more control over crops. With the help of genetics, farmers will be able to grow plants for us to eat that have higher protein, lower oil, and the ability to grow faster than ever before.

Scientists also use genetic techniques with animals. For example, they use genetic breeding techniques to create chickens that lay more eggs. They produce pigs and cattle that contain meat with more or less fat, depending on how people like it. They create cows that grow faster and produce more milk. They haven't yet figured out how to get them to produce chocolate milk, but I'm sure they are working on it!

Genetics sounds like a great thing for farming. Why wouldn't we want crops that grow faster and taste better, cows that produce more milk, and meat that is low in fat? Well, some say that genetically altering our crops and animals will damage their genetic **diversity**. By only breeding for a select group of traits, many other useful plant and animal traits may be lost forever.



The lack of genetic diversity among our crops and animals may also leave them vulnerable to a single virus that could wipe out an entire species.

Selectively bred piglets grow up faster than their wild cousins.

What happens when you crossbreed two entirely different species of animals, like a dog and an elephant? Do you get barking elephants or dogs with trunks? This might seem ridiculous, but scientists are currently experimenting with crossbreeding different species. Because this has never been done before, some people are worried that these creations might have a negative effect on our environment and on us.

In the future, you will probably hear a lot about this issue. People in favor of genetically altered plants and animals want to improve food productivity. Those against using genetics are concerned about the unknown effects it might have on our environment and our health.

Do You Know?

Scientists have created GMOs (genetically modified organisms) by snipping individual genes from one organism and implanting them in another. Some GMOs provide food with extra nutrients, such as adding vitamin B to rice, while others create crops with built-in pesticides and preservatives. But there are concerns about GMOs. They may be able to provide nutrients and cut down on pesticides and preservatives, but scientists cannot predict how foreign genes will react in an organism. Some people had allergic reactions to GMO corn in taco shells. The European Union has banned GMOs until further studies are done. Many in the U.S. call for a labeling system that identifies foods containing GMOs. Already, many of the common foods we eat contain GMOs.

Animal Breeding

Animal breeders use some of the same genetic techniques as plant scientists. These include selective breeding and **hybridization**.



Hybridization, or crossbreeding, is when different varieties or even species are bred to combine the best characteristics of both. For example, female horses can be bred with male donkeys to produce mules. Mules are a hybrid of horses and donkeys, and they are tough like donkeys, but more agile like horses. They make very good work animals.



A donkey (top) crossed with a horse (left) yields a mule (right).

Although many dog breeders raise dogs only for show, a lot of dogs are bred for specific purposes, such as hunting, herding, or guarding. Some of the earliest hunting dogs were spaniels. Spaniels, like the familiar springer and cocker spaniels, were first bred in Spain to hunt water birds like ducks, or land birds like pheasants. Dog breeders determine the traits they want a dog to have and then select parents that, when bred, will pass on those traits to their offspring.

Spaniels are bred into large and small versions. Today, the larger dogs are known as setters, such as the Irish setter. They got the name *setter* because they “set,” or crouch, when locating wild game.



Irish setters

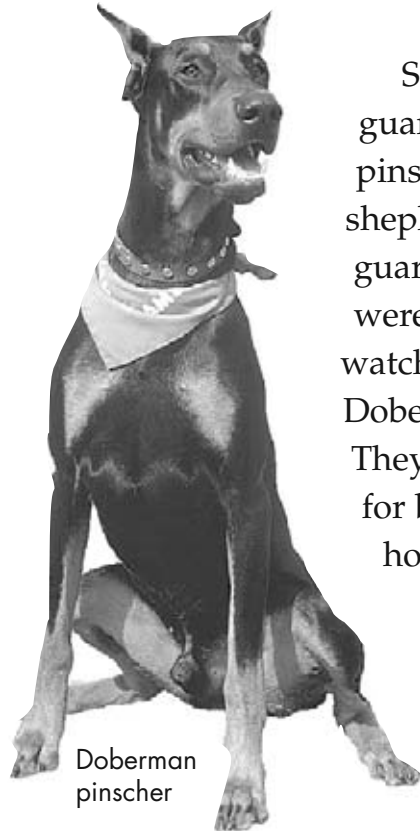


Border collies are excellent herders.

The ability to herd is another desirable trait that is bred into some dogs. Herding dogs are used to protect and round up cattle and other livestock. Border collies and Australian sheepdogs are popular herding dogs. They have been so well bred that they continue to herd animals even if they aren’t trained to. Many people who own Border collies report that their dogs attempt to herd cars and even people!

The Border collie has been around since the 1600s. It was originally used to herd cattle and sheep along the English-Scottish border.

The Australian sheepdog was developed from several herding breeds, including the Border collie, which English settlers brought with them to Australia. These sheepdogs are still widely used in Australia, where many cattle and other livestock are raised in open fields.



Doberman
pinscher

Some dogs are bred as guard dogs. The Doberman pinscher and the German shepherd are two common guard dogs. Dobermans were first bred by a German watchman named Louis Dobermann in the late 1890s. They have a reputation for being ferocious dogs; however, recent breeders have worked hard to make the Doberman a calmer, friendlier dog.

Many dogs are hybrids—crosses between two or more breeds. Some

people believe that hybrids make the best pets because they combine the best traits of both parents.



Mutts combine the best traits of many breeds.



Pandas have benefited from captive breeding programs.

Animals in Zoos

In addition to providing education and entertainment, many zoos are also places for animal research. Genetics is an area of animal research that takes place in some zoos. This research is conducted to ensure that animal species survive well into the future. Genetics plays an important role in protecting many endangered and threatened animal species.

One technique that zoo scientists use to increase endangered species populations is **captive breeding**. Captive breeding is the breeding of animals that are living in captivity (such as in zoos) for the purpose of releasing their offspring into the wild. Captive breeding is only successful if the animals can survive and reproduce on their own once they are released into the wild.

Captive breeding is often done with species that are nearly extinct. It gives the animals a chance to reproduce in an environment

where they are protected. Although many may die when they are released into the wild, others do survive when placed back in their natural **habitat**. Captive breeding is being used with endangered and threatened species, such as the red wolf, gorilla, panda, cheetah, and rhinoceros.



A cheetah

Although captive breeding is important, it cannot replace animals living and breeding in the wild. Zoo employees also try to educate people about the importance of protecting the habitats of endangered and threatened species. If wild animals such as rhinoceroses and tigers are not protected, future generations will only be able to read about them in books.



Do You Know?

Red and gray wolves are the only two species of wolves known in the world. The endangered red wolf is found in the southeastern United States. The gray wolf is found in arctic and subarctic regions around the world.

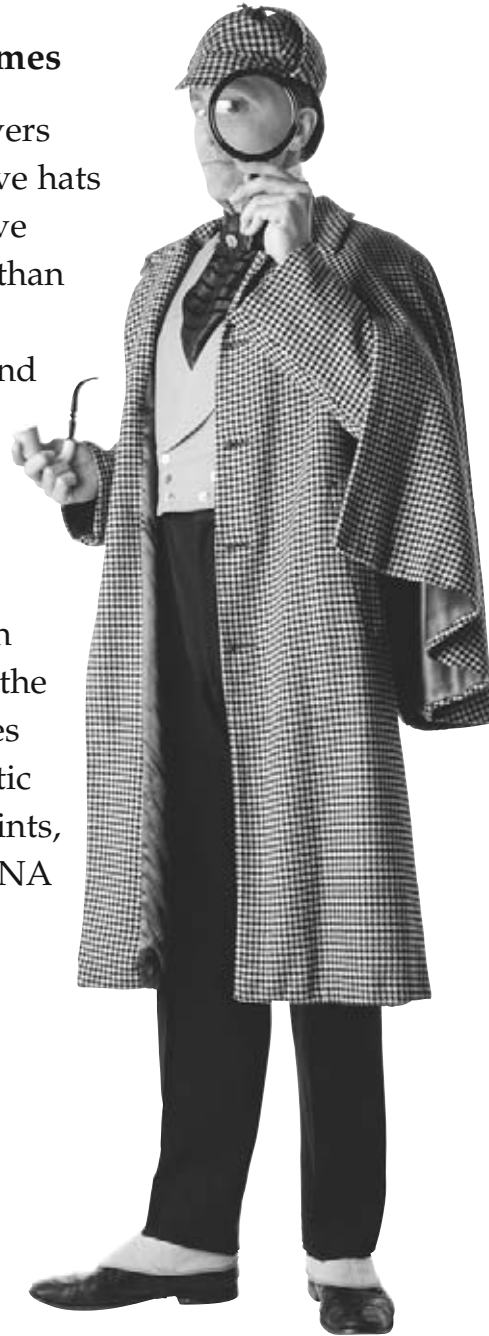
The once-common gray wolf has only recently been brought back into the United States.

Solving Crimes

When crime solvers put on their detective hats these days, they have more to work with than a magnifying glass. Police, detectives, and lawyers all now use genetics and **DNA** to help solve crimes.

All genes contain DNA. DNA carries the code that determines an organism's genetic traits. Like fingerprints, every organism's DNA is different.

Today, detectives have more clues to work with than ever before.



A lab agent works on DNA evidence.

By fingerprinting criminals, police can keep a database of fingerprints. When they find fingerprints at a crime scene, they match them with the fingerprints of known criminals in the database.

Because, like fingerprints, DNA is unique, we use the term “DNA

fingerprinting” for the use of DNA to solve crimes. The advantage of using DNA is that you do not need to find a fingerprint. Many criminals know that fingerprints are used to solve crimes, so they wear gloves or wipe away their fingerprints.

To get a “DNA fingerprint” of a criminal, all you need is a small bit of skin, a single hair, or a drop of fluid such as blood or saliva. It is almost impossible for a criminal not to leave behind a trace of skin, hair, or fluid. Everywhere a person goes, he or she leaves microscopic traces of DNA.

For example, if investigators find skin cells under a victim's fingernails, they can determine the DNA of the skin cells. They then take a DNA sample from the suspect. If the two samples match, the investigators are closer to solving the crime.

Law enforcement agencies are now building databases of DNA samples, much like they keep collections of fingerprints. These databases contain the DNA fingerprints of convicted criminals, as well as other evidence found at crime scenes. DNA also has been used to free people who were wrongly convicted of crimes.



Donald Reynolds (left, with his lawyer) was released from jail after being falsely imprisoned for 11 years. DNA evidence proved that he could not have committed the crime of which he had been accused.

DNA fingerprinting has helped solve many crimes since it was first used in 1985. However, some people are concerned about the accuracy and cost of DNA testing, as well as its possible misuse. Even so, DNA fingerprinting will continue to be used as long as it helps identify criminals and solve crimes.



A scientist compares DNA "fingerprints" on a computer screen.

Health

Genetics is also used by many medical and health-care scientists. Genetics is used to diagnose, treat, and prevent diseases, as well as to develop new medicines. Medical scientists are now discovering many genes that cause specific diseases. Identifying genes that cause a specific disease helps scientists develop medicines and vaccines to cure or prevent the disease.

Genetics counselors also use genetics. They help parents and future parents figure out the odds of passing on genetic disorders to their children. Parents use this information to help them decide whether to have children, or how to cope with the possibility of caring for children with genetic disorders. Some common genetic disorders that may be passed on from parents to their children are cystic fibrosis, Huntington's disease, and breast cancer.

Do You Know?

In 2000, scientists completed the Human Genome Project, a full map of the location of every human gene. Humans have over 1.4 million genes arranged in a specific order in our chromosomes. It took powerful computers 10 years to count and locate them all. Many diseases are caused by genes that are missing or in the wrong place.

Conclusion

The field of genetics offers many job opportunities. Genetics is an exciting and relatively new branch of science. Each day brings new developments and new opportunities.

Whether it is plant and animal breeding, medicine, criminology, or some other field, career opportunities linked to genetics abound. Check the library or the Internet for additional information about this exciting field of science.



Dolly

Do You Know?

The first healthy mammal ever cloned was a sheep. Cloning is the creation of an exact genetic copy of a particular living thing. The first cloned sheep, born in February, 1997, was named Dolly.

Explore More

❶ At the Library

Ask your librarian where you can find books about genetics.

❷ On the Web

- A. In the address window, type: *www.google.com*.
- B. Then type: *genetics*. Click on “Google Search.”
- C. Read the colored links. Click on one that looks interesting.
- D. When you want to explore other links, click the back arrow on the top left.
- E. Or try some different searches: *selective breeding*, *genetic diversity*, *hybridization*, *captive breeding*, or *DNA evidence*.

❸ In the News

Genetics is still a new and controversial field of science. Check out local and national newspapers, news magazines, television, and radio for these genetics topics:

- A. Crimes that have been solved using DNA
- B. Experiments in cloning
- C. New medicines developed using genetics
- D. Controversy over genetically modified foods and animals

Glossary

captive breeding	the breeding of animals that live in captivity (p. 15)
diversity	variety (p. 8)
DNA	a code of how a living thing is put together found in all cells (p. 17)
genes	units of heredity that transfer traits from one generation to the next (p. 5)
genetics	the field of science that studies how traits are passed on (p. 4)
habitat	the natural conditions in which a plant or animal lives (p. 15)
hybridization	when similar but different species are bred to combine the best characteristics of both (p. 10)
inherited	a characteristic or trait that has been genetically passed down from a relative (p. 5)
propagate	to repeat; to create over and over; to reproduce (p. 7)
selective breeding	the breeding of plants or animals that have desirable characteristics with other plants or animals that have the same or other desirable characteristics (p. 6)

Name _____

INSTRUCTIONS: Fill out the chart below. Summarize the information in *Genetics at Work* as concisely as possible.

	Purpose of Genetic Research	Results of Genetic Research	Concerns about the Research
Farming			
Animal Breeding			
Solving Crimes			
Health			

Name _____

INSTRUCTIONS: Read through *Genetics at Work* and find seven adjectives or adverbs. Write down each adjective or adverb and the word it describes, and the page number where the phrase can be found. Explain how the adjective or adverb helps readers understand the facts in the text. The first is done for you.

Descriptive Phrase	Page #	What the Words Tell Me
new science	6	Compared to other fields of science, genetics is a new science that has recently been developed and researched.

Abraham Lincoln: From Log Cabin to the White House

A Reading A-Z Level Z Leveled Reader

Word Count: 2,004



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ABRAHAM LINCOLN

From Log Cabin to the White House

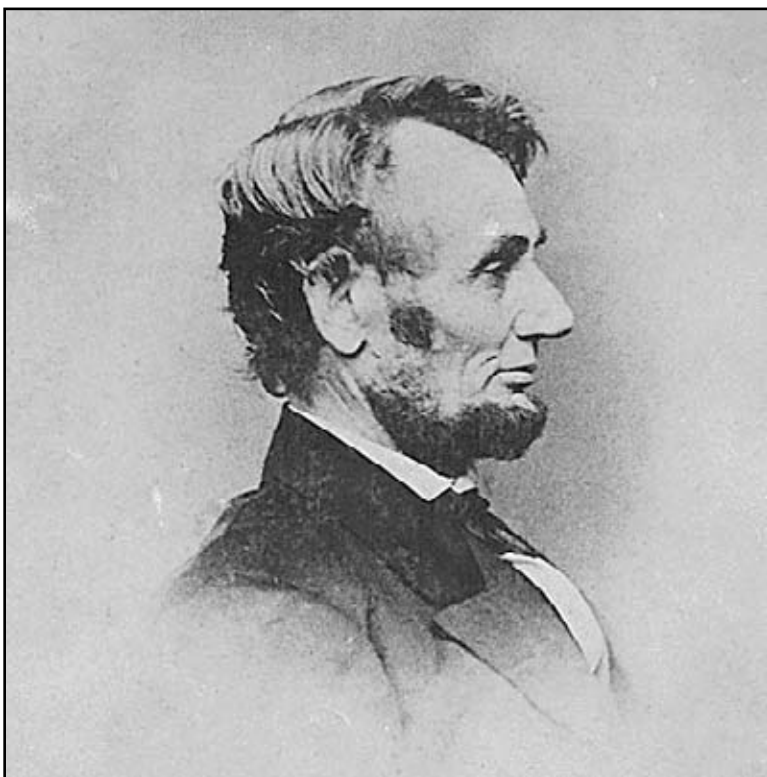


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ABRAHAM LINCOLN

From Log Cabin to the White House



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Cover: Lincoln photographed in 1864

Abraham Lincoln: From Log Cabin to the White House

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Table of Contents

Introduction.....	4
The Early Years	6
Law and Politics.....	11
America Divided	15
The War Years	18
Timeline.....	24
Explore More.....	25
Glossary	26



The Lincoln Memorial in Washington, D.C.

Introduction

Abraham Lincoln, one of the most famous American presidents, is remembered for his dedication to freedom. Lincoln led the United States during the Civil War, 1861 to 1865, when the northern and southern states fought to decide the future of the country. He is known as the “Great **Emancipator**” because he freed the slaves. After the war, the United States became one nation, pledged to freedom and democracy for all.

We think of Abraham Lincoln as a great American folk hero and tell many stories and legends about him. He is often pictured as tall, lanky, and **solemn**. He is remembered as a “common man” who was born in a log cabin in Kentucky with little regular schooling. Yet he became a great lawyer, speaker, and political leader. His **eloquent** speeches about freedom, justice, and uniting all Americans are carved in stone at the Lincoln Memorial in Washington, D.C.

His belief was simple: “As I would not be a slave, so I would not be a master. This expresses my idea of democracy.”



President Lincoln with General McClellan and a group of officers, Antietam, Maryland, October 3, 1862.

The Early Years

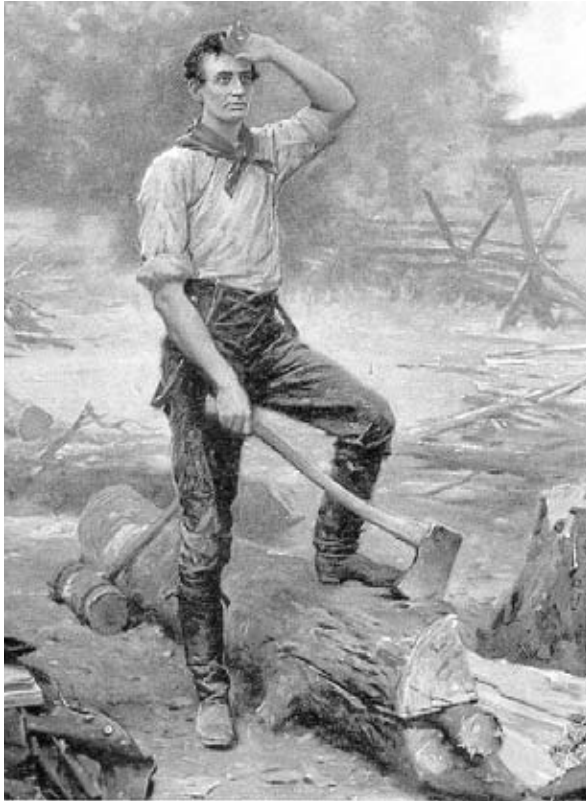
Abraham Lincoln was born to Thomas and Nancy Hanks Lincoln on February 12, 1809, on a small log-cabin farm near Hodgenville, Kentucky. After moving to nearby Knob Creek, Abe and his older sister, Sarah, went to school for short periods during the winters. His mother, Nancy, encouraged their “edication,” but his father, Tom, wanted Abe to help with chores. His mother and father could neither read nor write.

When Abe was seven, the family moved to Indiana, hoping for a better life. Two years after Tom built a new log cabin, Nancy became ill with “milk sickness” and died. Abe and Sarah mourned the death of their hard-working, loving mother.



This cabin is constructed of logs that are believed to be from Lincoln’s birth cabin. The cabin is located at the Abraham Lincoln Birthplace National Historic Site in Hodgenville, Kentucky.

Lincoln became known as a "rail splitter" from his work as a young man.

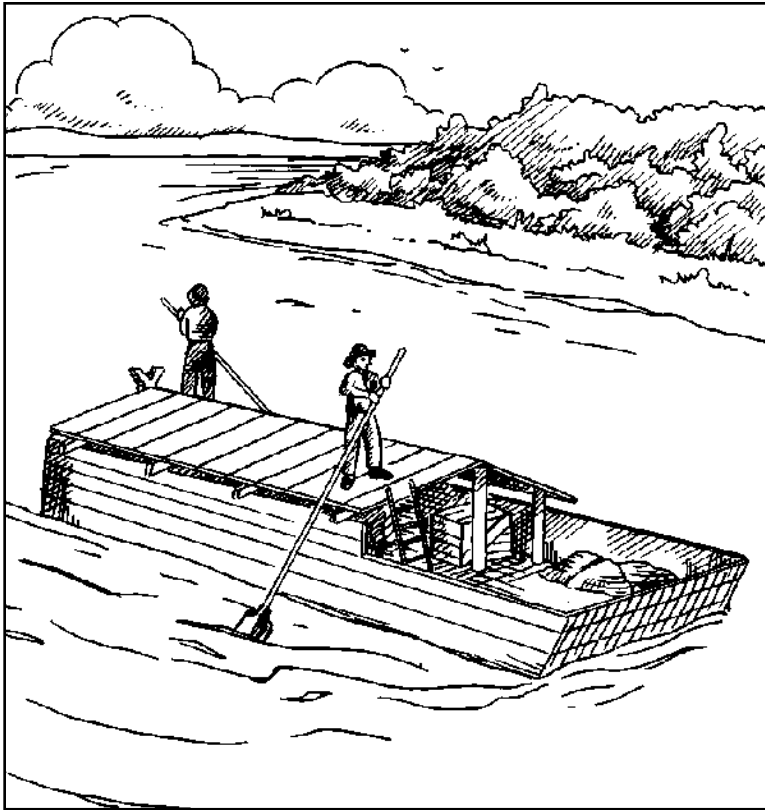


Soon after, Abe's father married Sarah Bush Johnston, a widow and mother of three whom Tom had known in Kentucky. With love and care, she created a warm life for Abe and Sarah. She encouraged Abe as he grew into a tall, awkward youth. He spent much time in the woods using his ax to **fell** trees and split logs for fences, wagons, and farm equipment. Friends told of Abe's moody quietness, even though Abe told **homey**, humorous stories.



Although he rarely went to school, Abe was devoted to learning.

Abe went to school for only a few weeks in the winters, walking 18 miles (29 km.) daily. Mostly he educated himself by borrowing books and newspapers from neighbors and travelers. These were frontier days when people moved westward, following Daniel Boone, Johnny Appleseed, and other pioneers. Their stories, and the books he read, sparked ideas of a world larger than Abe's back woods. They prepared him for adulthood and his political career.



Abe traveled on a flatboat to the city of New Orleans.

As a teenager, Abe, now a strong 6 feet 4 inches (2 m.), traveled down the Mississippi on a flatboat loaded with produce. He floated, steering with a pole, to the busy port of New Orleans, where he saw the city's wonders and people of many colors and nationalities. For the first time, Abe saw black men, women, and children chained at slave-holding pens and auction blocks to be bought and sold.



Abe's early campaigns made him a skilled communicator.

After Abe's return, his father again moved the family westward to central Illinois near the town of Decatur. Abe helped his father build a new log cabin, and soon after, left the homestead at age 22. In the frontier village of New Salem, Abe worked various jobs including storekeeper, surveyor, and carpenter. He became well known as a wrestler and as a skilled **orator** in the New Salem Debating Society. He ran for the Illinois State Legislature, losing in 1832 but succeeding two years later. A lawyer and fellow legislator, John Todd Stuart, encouraged Abe to study law. Abe read law books, passed the exams in March 1837, and joined Stuart's law practice, moving to Springfield where the Illinois legislature met.

Law and Politics

Abraham Lincoln's views were based on his strong belief in democratic rights for the common man—that each person was important regardless of wealth or privilege. He became a respected member of the Whig party, supporting strong central government in Washington, D.C. The other leading party, the Democrats, believed in “states’ rights,” or that states should control their own affairs without interference from Washington.

At the age of 30, Lincoln met his future wife, Mary Ann Todd. She was the fashionable daughter of a wealthy Kentucky banker. Her background was very different from Lincoln's, yet they fell in love. After overcoming Mary's parents' objections, they married on November 4, 1842. They had one son. In 1846, Lincoln won the election for Illinois representative to the U.S. Congress and moved to Washington, D.C., with his family.



Mary Todd Lincoln, 1846

Lincoln was in Congress as the northern and southern states became more divided over the issue of slavery. The North depended on free laborers in its factories and small farms, and believed in a strong central government. Slavery was outlawed in the northern states. The South, whose economy revolved around “king cotton” grown on large plantations, used slave labor. Slaves, primarily black Africans, were owned as property. Most lived under very poor conditions and were treated **inhumanely**. They had no personal or **civil rights**. The laws of southern states allowed and protected slavery. The U.S. expanded as western territories applied for statehood. Would these states enter as “free” or “slave” states? The South wanted new lands for slave-grown cotton. The North wanted the country to promote independent farms and free labor.

Lincoln opposed slavery, but as an Illinois representative in Washington, he believed that the practice was protected by the state laws in the South. However, he fought the spread of slavery in the western territories.



This building in Atlanta, Georgia, was used to sell slaves.

During the 1840s, the abolitionist movement, which wanted to outlaw slavery, grew. Its followers, both whites and free blacks, demanded an end to the horrors and inhumanity of holding humans in **bondage**.

Lincoln returned to Springfield after two years in Washington, and for the next few years shared a successful law practice with his partner, William Herndon. Lincoln became known for his honesty, legal abilities, wit, and fine oratory.

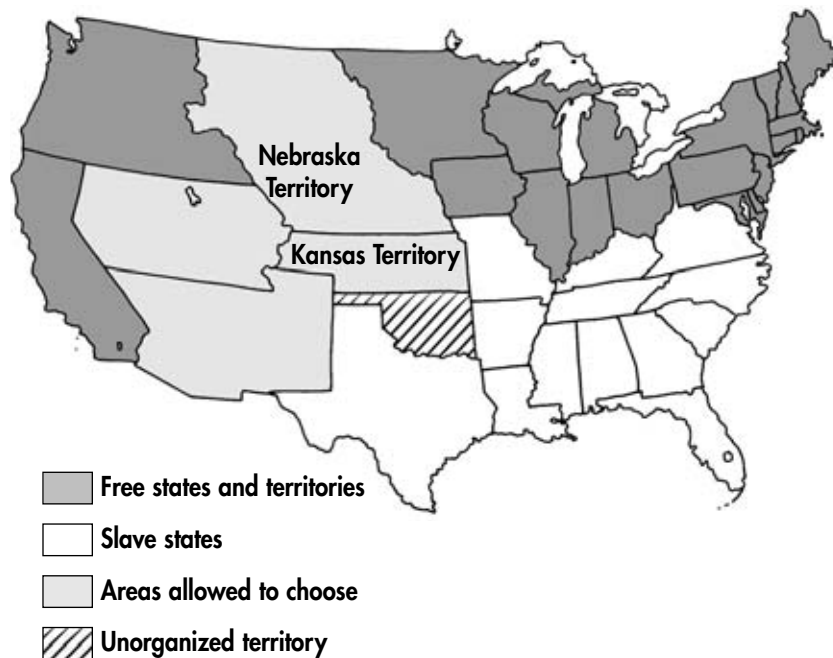


Lincoln with his son Tad, 1864

In February 1850, Abraham and Mary faced tragedy when their boy Eddie, nearly four years old, died of tuberculosis. Both parents were deeply depressed, and Mary showed signs of emotional imbalance. In December of that year, a son named William Wallace was born, and three years later came another son, Thomas, or Tad for short. Lincoln was very close to his sons and was a proud and loving father.

America Divided

Meanwhile in the 1850s, the pro- and anti-slavery forces struggled for power. Congress passed the Kansas-Nebraska Act in 1854. This cancelled an earlier law that forbade slavery in these territories. The new law allowed the residents to decide whether they wanted to be free or slave states. This principle of letting the people decide, called “popular sovereignty,” was introduced by an old political rival of Lincoln’s, Stephen Douglas, now a U.S. senator from Illinois.



The free and slave states shortly before the Civil War



Lincoln in 1858, two weeks before his final debate with Douglas

Abraham decided it was time to speak out against the spread of slavery and to try again for political office. He joined the new Republican Party, which opposed slavery, and was nominated in 1858 as their candidate for senator. His opponent was his old enemy, Senator Douglas. During the campaign, they held the Lincoln-Douglas

debates, which captured the attention of the country. Lincoln, with great oratorical skill, exclaimed that slavery was causing a national crisis. “A house divided against itself cannot stand. I believe this government cannot endure, permanently half slave and half free.” Lincoln argued that blacks were entitled to the “right to life, liberty, and the pursuit of happiness,” just like whites. Douglas said that the Constitution guaranteed equality only to white citizens, not to blacks. Each state, he believed, had the right to decide whether it would be slave or free.



Stephen A. Douglas

Lincoln lost the election, but the debates made him popular, particularly in the Republican Party. By 1860, he was the party's choice for president. In his campaign rallies and parades, he was called "Honest Abe," the **homespun** rail-splitter, a man of the people who stood for equality and freedom.

On November 6, 1860, Lincoln was elected president of the United States. The North and the western territories rejoiced; the South was outraged. Even before Lincoln's inauguration on March 4, 1861, seven southern states voted to **secede** from the United States of America. By February, the pro-slavery states had established a government, the Confederate States of America, under President Jefferson Davis, and prepared for war.



Lincoln in 1861. He first grew a beard after winning the presidency but before moving to Washington. The beard was a suggestion from an 11-year-old girl.



Inauguration of Lincoln, March 4, 1861, at the U.S. Capitol, which was still under construction

The War Years

President Lincoln, still hoping to avoid bloodshed, said in his inauguration speech, "In your hands, my dissatisfied countrymen, and not in mine, is the momentous issue of civil war." But events moved swiftly, and by April 14, northern troops had surrendered Fort Sumpter after South Carolina cannons fired on the fort. Both sides, the Union and the Confederacy, quickly **mobilized**, calling volunteers and collecting arms and supplies. President Lincoln, from his home and office in the Union city of Washington, D.C., could look across the river to the Confederate state of Virginia.

The South's superior military leadership defeated Union forces in the first battle at Bull Run. Lincoln struggled to find strong commanders to lead the Union troops throughout the war. Under General George B. McClellan, the Union armies had some successes, but by 1862 they were stopped by Confederate General Robert E. Lee. Although Union forces controlled New Orleans and the Mississippi River, there were few victories. Lincoln took over more of the military planning as the North called for action. Enormous numbers of young soldiers on both sides were killed, wounded, or missing as the war continued into its second year.



President Lincoln with General McClellan at Antietam. General McClellan would soon be replaced.

For Mary and Abraham Lincoln, personal loss threw them into deep despair. Their second son, Willie, died of fever in February 1862. Mary would never fully recover from her grief. Abraham shared his great sadness when he met with the many families mourning war dead. On the war front, the Union lost the second battle of Bull Run, and at Antietam in September 1862, both sides suffered the bloodiest **engagement** of the war. Powerful Republican senators urged President Lincoln to make the abolition of slavery a war goal. They argued that to fight the war successfully, the Union needed to remove the issue that caused the war. Lincoln was finally convinced that as president, he had the authority to order abolition in the South. On January 1, 1863, the Emancipation Proclamation went into effect, freeing “thenceforth and forever” all the slaves in the South. Freed blacks rushed to join the Union army, and by the end of the war, over 180,000 former slaves had volunteered.



Company E, 4th U.S. Colored Infantry was composed of former slaves and other free black men.



Dead Union soldiers on the battlefield at Gettysburg, Pennsylvania

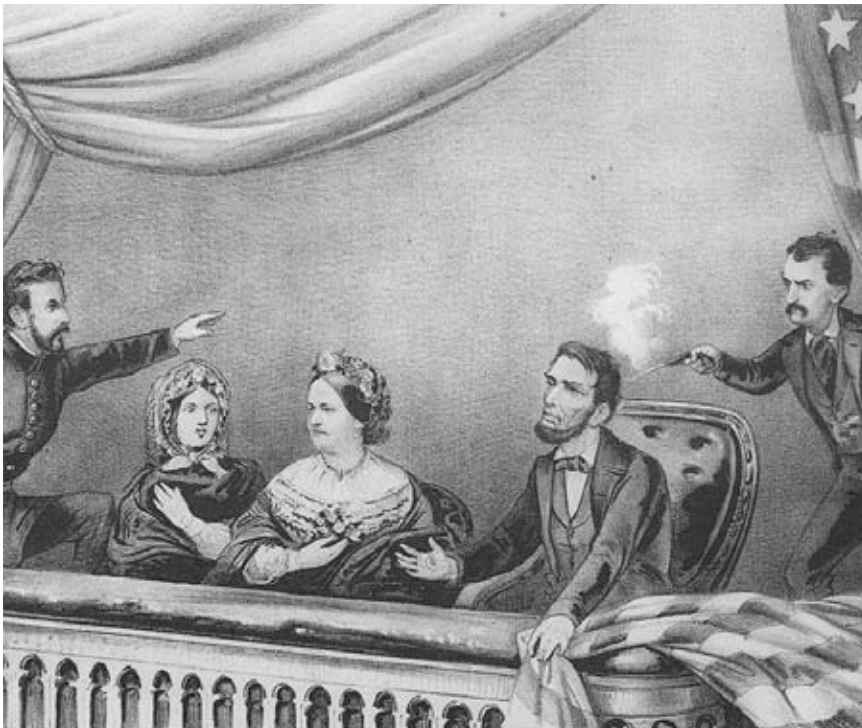
The summer of 1863 brought victory to Union forces at Gettysburg, a turning point in the war. President Lincoln, while dedicating a cemetery to the many soldiers who had died on both sides, delivered his famous Gettysburg Address. The speech lasted only two minutes, yet it is remembered for its simple beauty and eloquence. Lincoln spoke of the war as a test of whether the nation could survive as a democracy. He challenged those still alive to complete the unfinished work of those who had died, "that the government of the people, by the people, for the people, shall not perish from the earth."



One of the last photographs taken of Lincoln, February 1865

Under the newly appointed General Ulysses S. Grant, the Union armies were victorious in the West and South. Lincoln saw hope of the war's end as Confederate troops were defeated in Georgia and Virginia in late 1864. He was reelected President and, in early 1865, cheered the Congressional passage of the Thirteenth Amendment to the U.S. Constitution, which prohibited slavery in the United States.

The war ended on April 9, 1865, four years after it began, and cost 600,000 lives. The Union was preserved, and slavery was abolished. But only six days later, President Abraham Lincoln lay dead from an assassin's bullet. A Confederate sympathizer, John Wilkes Booth, shot Lincoln while he attended a play at Washington's Ford Theatre. As Lincoln's body was carried back to his beloved Illinois on a funeral train, mourners by the roadside silently saluted this great American hero.



An 1865 depiction of Lincoln's assassination

Timeline

- 1809 Abraham Lincoln born on February 12 in Kentucky
- 1818 Abraham's mother, Nancy, dies
Thomas Lincoln marries Sarah Bush Johnson the following year
- 1834 Lincoln elected to Illinois state legislature
- 1837 Opens law practice in Springfield, Illinois
- 1842 Abraham marries Mary Todd
- 1846 Lincoln elected to U.S. House of Representatives
- 1850 Four-year-old son, Edward, dies
- 1858 Lincoln-Douglas debates
Lincoln becomes a leader on anti-slavery issue
- 1860 Lincoln elected president of the U.S.
- 1861 Civil War begins when Confederates fire on Fort Sumpter
- 1862 Son William dies at age twelve
Battle of Antietam
- 1863 Lincoln issues Emancipation Proclamation
Union victory at Gettysburg
- 1865 Confederate forces surrender, ending the Civil War
Lincoln shot on the evening of April 14 and dies the following day

Explore More

❶ At the Library

Ask your librarian to help you find more books about Abraham Lincoln. You may also want to look for books about the Civil War and the end of slavery.

❷ On the Web

- In the address window, type: *www.google.com*
- Then type: *Abraham Lincoln*. Click on “Google Search.”
- Read the colored links. Click on one that looks interesting.
- When you want to explore other links, click the “back” arrow on the top left.
- You can also try different searches: *Civil War*, *Emancipation Proclamation*, *Lincoln-Douglas debates*, or *abolition*.

❸ Historical Perspective

Lincoln’s Emancipation Proclamation was only the first step toward granting African-Americans equal rights. Until the Civil Rights movement of the 1960s, African-Americans were routinely denied jobs, voting rights, and basic human respect. Ask your librarian about books on the Civil Rights movement, or search the Internet for *Civil Rights movement* or *Dr. Martin Luther King, Jr.*

Glossary

bondage	slavery; capture (p. 13)
civil rights	citizens’ rights, such as voting, based on a nation’s constitution (p. 12)
eloquent	simple, powerful, and elegant (p. 5)
emancipator	a person who sets others free (p. 4)
engagement	battle (p. 20)
fell	cut down (p. 7)
homespun	humble; from a simple rural background (p. 17)
homey	familiar, simple, and humble (p. 7)
inhumanely	without dignity or kindness (p. 12)
mobilized	positioning troops and supplies in preparation for war (p. 18)
orator	speaker (p. 10)
secede	to separate from (p. 17)
solemn	serious; slightly sad (p. 5)

Name _____

INSTRUCTIONS: Before reading *Abraham Lincoln: From Log Cabin to the White House*, fill in the first column with facts you know. Write any questions you have about Abraham Lincoln in the second column. After reading the book, fill in the third column with what you learned.

What I Know about Lincoln	Questions I Have about Lincoln	What I Learned about Lincoln

Name _____

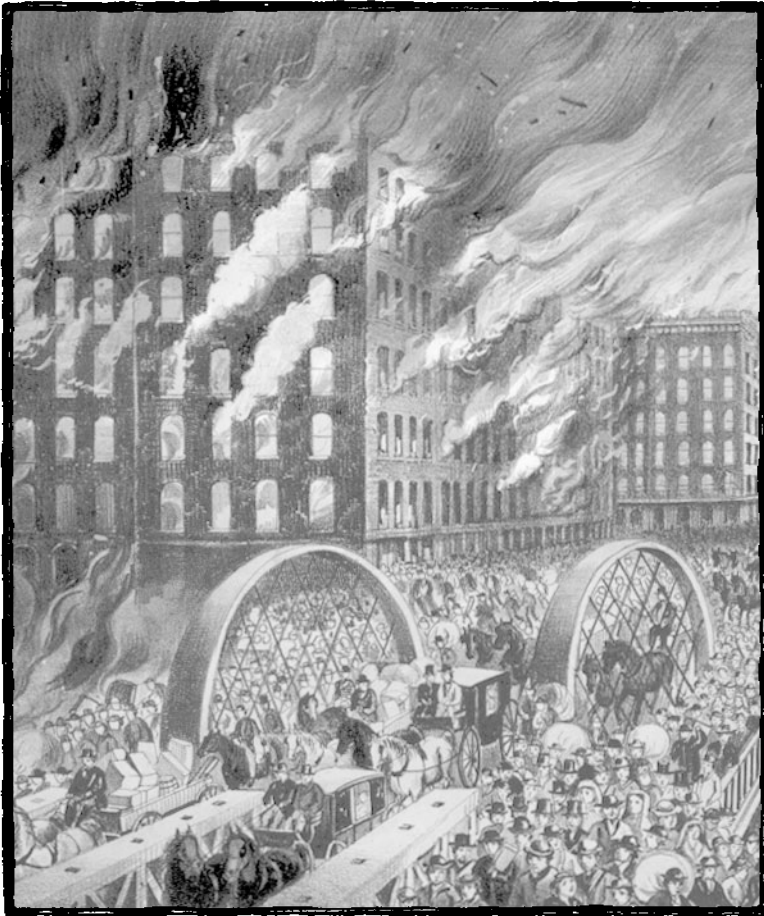
INSTRUCTIONS: After reading *Abraham Lincoln: From Log Cabin to the White House*, find 12 descriptive words from the book. List them in the first column. In the second column, write the page number where you found each word. Write the word each one describes in the third column.

Descriptive Words	Page Found	Word It Describes
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Great City Fires

A Reading A-Z Level Z Leveled Reader

Word Count: 1,924

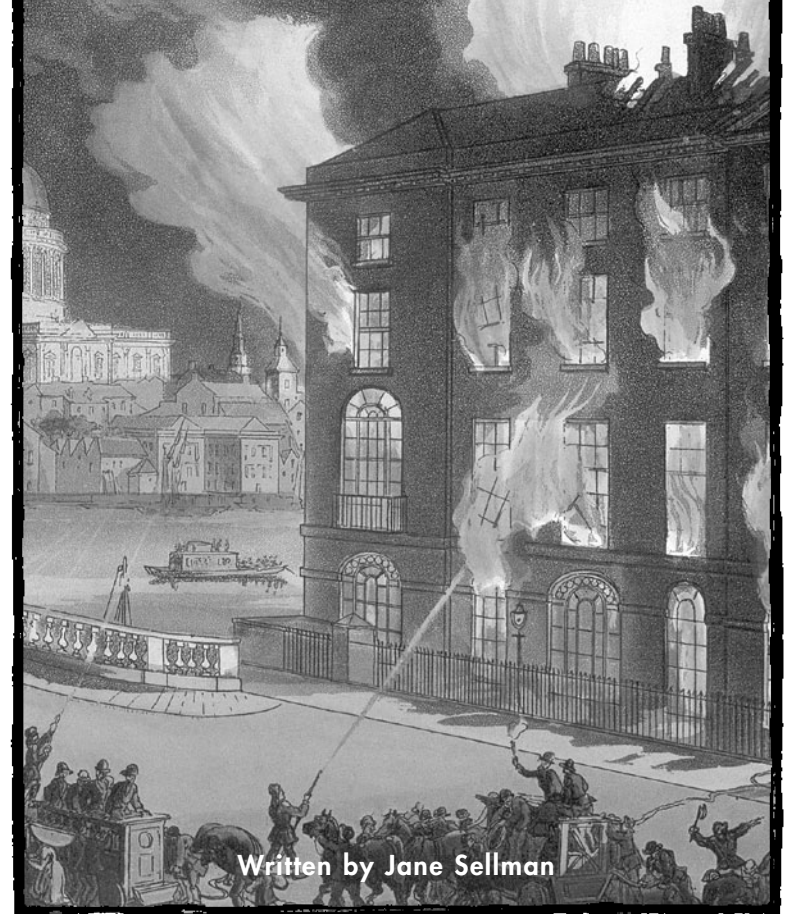


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Great City Fires



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Front cover: London firefighters try to put out the inferno while they can.

Great City Fires
Level Z Leveled Reader
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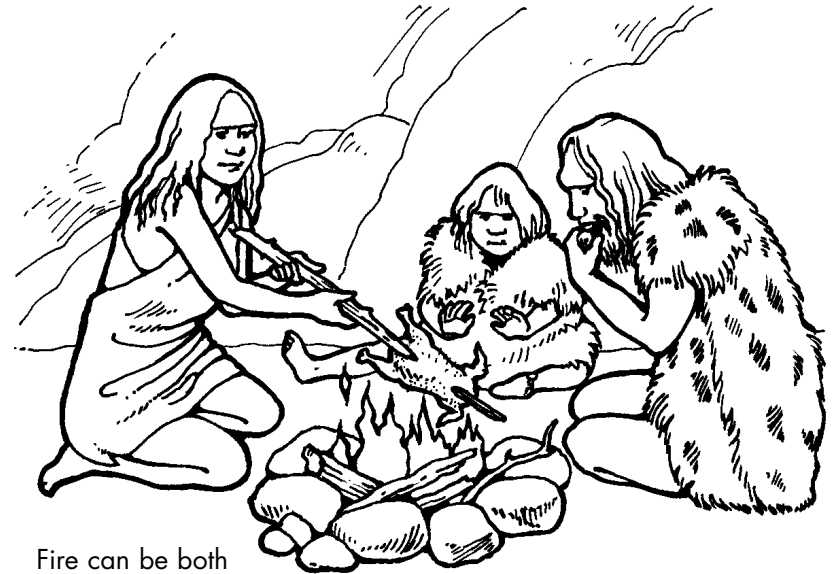
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Correlation

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Fountas & Pinnell	V
Reading Recovery	29
DRA	N/A

Table of Contents

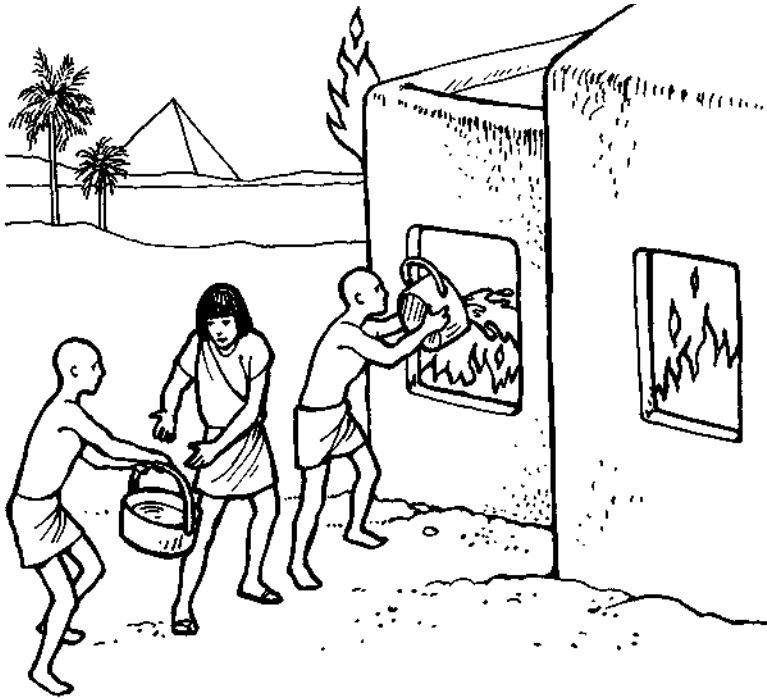
Introduction.....	4
The Fire of Rome	6
Great Fire of London.....	9
Chicago Fire.....	14
Conclusion.....	20
Fire Safety Tips.....	21
Glossary	24



Fire can be both
useful and dangerous.

Introduction

Thousands of years ago, people discovered how to use fire to keep themselves warm and cook their food. But since that time, fire has occasionally escaped our control and ravaged our homes and cities. Arsonists—people who set fires on purpose—kill hundreds of people and cause millions of dollars in property damage each year. People have used fire as a weapon, from burning parts of Jerusalem during the Crusades to firebombing German cities during World War II. But most city fires, large or small, are caused by human accidents and unsafe conditions.



The Egyptians developed ways to fight fires, but only after a destructive fire occurred.

Unfortunately, misfortune is often the best teacher. Victims of city fires became aware of the need for fire safety, fire prevention, and firefighting only after the flames were out. After a great fire in ancient Egypt, the Egyptians invented a water pump and organized **bucket brigades** in which volunteers passed buckets of water down a line of people to the fire. Terrible fires in Rome, London, and Chicago caused great destruction, yet they resulted in new ways to prevent and fight fires.

The Fire of Rome

In A.D. 64, life in Rome had both the good and the not-so-good aspects of a big city. One could visit libraries, art galleries, and markets. Citizens could attend chariot races at the Circus Maximus, Rome's stadium, which could hold more people than most modern football stadiums. The rich had indoor plumbing and comfortable, spacious homes, but most of Rome's citizens, who numbered more than a million, lived in cramped, stuffy apartment buildings up to six stories tall. Everyone in these poorly made, flammable wooden buildings shared a first-floor bathroom and used open flames for cooking and for light.

During the summer of A.D. 64, the heat in Rome was horrible, everything was dry, and fires in the city were common. On July 19, a fire started in one of the shops near the Circus Maximus. Aided by warm breezes, it spread through the marketplace, parts of the stadium, and neighboring homes. The Roman firemen did their best with hand pumps and leather hoses, but the fire advanced too quickly, and panicked crowds and **unruly** mobs got in their way.

That summer, Emperor Nero had retreated to his coastal home because of the heat, but he



Roman citizens panic as their homes and temples burn.

returned to Rome to supervise the firefighting. Bucket brigades started, and people created **firebreaks**, or areas in the path of the fire that were cleared of anything that could burn. The fire stopped and started several times over nine days, but finally, a combination of firebreaks and plain good luck brought the fire to an end. Thousands had lost their homes and livelihoods, and no one knows for sure how many died.

Nero organized efforts to help the homeless by creating temporary shelters in his own gardens and in public buildings and parks. Extra supplies of food arrived from outside Rome, and Nero ordered merchants to lower the price of grain.

Despite all his efforts, many Romans believed that Nero had started the fire in order to rebuild the city in honor of himself. To avoid being blamed, he led people to believe that Christians had set the fire, and this was used as an excuse to **persecute**, or mistreat, the Christians.



Emperor Nero

The Romans did learn from the fire. They made sure a large supply of water would always be close by, constructed new buildings from stone instead of wood, and even filled in marshy areas with burned debris. A new city with wider streets and safer homes took the place of the old.

Do You Know?

Roman schools taught students to read and write Latin and Greek. One Latin word students learned is *flamma*, one of many Latin words for fire. Some English words that come from the word *flamma* include *flame* and *flammable*.

Great Fire of London

Sixteen hundred years later, people in other parts of the world hadn't made much progress in improving daily life or preventing fires. In London in 1666, people dumped garbage in the streets and considered bathing unimportant. Rats carrying bubonic plague infested most buildings, and their fleas spread the disease by biting people. Thousands had died from the plague in the years before the fire. Wooden buildings with **thatched roofs** had been placed so close together that the upper stories jutted out over the narrow streets, almost touching.

Still, living in London must have been exciting. A person might get a glimpse of the king, Charles II, riding through town, see a good play, or relax in a coffeehouse among local celebrities. For a few pennies, one could buy a fresh, warm roll at the shop of Thomas Farynor, the king's baker, in Pudding Lane.

On the evening of September 1, 1666, Thomas Farynor had finished work and put out the cook fires. Or so he thought! Around one in the morning, a spark from one of the ovens landed on a woodpile and set it ablaze. Thomas awoke to the cry of "Fire!" His family and servants tried

to leave the house, but clouds of smoke came up the stairs. They climbed out an attic window and jumped across to the roof next door.

Neighbors grabbed buckets from a nearby building and tried to put the fire out, but it was soon out of control. Many picked up what they could carry and took their families to safety. Yet the fire still could have been stopped, or at least slowed. A **fire hook**, a long pole, could have pulled building material out of the fire's path to make a firebreak. However, Mayor Thomas Bludworth didn't think the fire was serious enough for such drastic action, and so the fire continued to spread.

Do You Know?

Have you ever kept a diary? Samuel Pepys (*peeps*) lived in London and survived both the plague and the Great Fire. He is remembered as one of the world's greatest diary keepers. Because of his diaries, we know a lot about the 17th century in England. You can find his diary in the library, and parts of it are on the Internet. You might enjoy reading it and learning about what life was like in London hundreds of years ago.



Londoners rush to escape the fire.

The roar of the flames and wind must have terrified those fleeing the fire. The fire reached warehouses full of rope, paper, and other flammable products. A maid alerted Samuel Pepys, a government official, to the spreading fire, and the alarmed Pepys sped off to tell the king.

King Charles sent soldiers and **militiamen** to fight the fire, and he set up “fire posts” with food, water, and equipment. Trained militiamen gathered at these posts to help out.

Charles put the duke of York in charge of the fire-fighting effort. The duke and his men created firebreaks by pulling down houses in the path of the fire and using gunpowder to blow up large buildings. Finally, the fire burned out and stopped.



Many medieval buildings in London were lost.

Records state that only nine people died in the fire, including one of Thomas Farynor’s maids, but the number is probably much higher. Many Londoners were left homeless and jobless, and 80 percent of the city had been destroyed—including 87 churches and more than 13,000 homes. Tent cities sprang up where **refugees** of the fire had gathered. Organized charity, such as the Red Cross, didn’t yet exist, so people relied on family, neighbors, churches, and employers for help.

King Charles put architects Christopher Wren and John Evelyn in charge of rebuilding the city. These planners replaced wood with brick and built wider streets and more space between houses, but the rebuilding took years to complete. St. Paul's Cathedral was not finished until 1712, 46 years after the fire. New laws required businesses and property owners to keep the streets and walkways free of garbage. But the fire was a terrible price to pay to improve the living habits of 100,000 Londoners.



The Thames River, flowing through London, was one of the few safe places.



Before the fire, Chicago was an enormous, booming city.

Chicago Fire

Chicago in the late 1800s really bustled. Its **stockyards**, where livestock was slaughtered and processed into meat, supplied much of the nation with food. Travelers crossing the country often stopped for a visit, and the city boasted fine restaurants and hotels, entertainment, big stores, and museums. Families could visit one of the beaches along Lake Michigan or go to the stockyards to watch cattle coming in from the West.

Like Rome and London, Chicago also had its share of **slums**—neighborhoods with poorly built wooden houses close together. Housing inspection was **lax**, and warehouses, not bound by fire codes, stored all kinds of flammable materials. However, Chicago did have a professional, though very overworked, fire department.

The summer of 1871 had been one of the driest anyone could remember. Only about 3.8 centimeters (1.5 in.) of rain fell between the Fourth of July and early October. Dead leaves dropped off dying trees, and firefighters became exhausted fighting the small fires that sprang up around the city.

On the evening of October 8, 1871, a spark ignited the hay in Catherine O’Leary’s barn on DeKoven Street. Mrs. O’Leary made a modest living selling milk, and it was later suspected that a cow started the fire by kicking over a lamp, though this was never proven.

The fire should have been put out quickly, but that night the firefighters went to the wrong address, and the fire rapidly traveled to other buildings. The winds that made Chicago famous as the “Windy City” helped spread the fire before

anyone could stop it. Even the Chicago River, covered with an oily film, caught fire. Then the **gasworks**, the plant that pumped gas for heating and light, went up in flames.

Travelers fled their hotels, and residents gathered their children. Many headed toward Lake Michigan in hope of escaping, and bridges became overcrowded with fleeing people. Hot cinders and sparks fell from the sky as the horrible noise of the fire mingled with the sound of church bells warning people in other parts of town. The smoke was so thick that people could not see a block in front of them.



Panicking people blocked many of Chicago’s bridges.

Wind and fire combined to make a **firestorm**, or a super-heated wind that spreads flame wherever it blows. Chunks of burning debris were picked up and flung down upon buildings holding oil, fabric, and kerosene—everything that would make the fire worse. Brave people, professional firefighters as well as citizens, stayed to battle the fire and rescue the helpless. But the flames destroyed even the water-pumping station, blocking the efforts of the fire department.

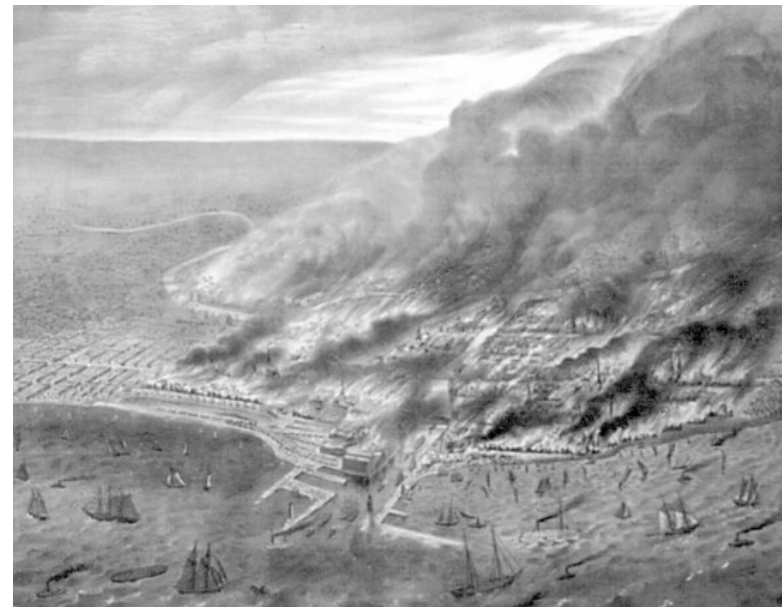
The luxurious hotels and the humble houses all fell into the flames as the fire burned for three days. Buildings not already on fire were blown up to create firebreaks. Then on the 10th of October, rain fell to help the firefighters extinguish the flames. The fire finally ended.

Though everyone was relieved, they soon realized their loss. About 300 people had died; others remained missing. People's homes, possessions, and workplaces were gone, dust and ash still filled the air, and areas of the city remained too hot to enter.

Federal troops, commanded by General Philip Sheridan, arrived to prevent **looting**. People sent supplies and volunteers to Chicago, and the fortunate survivors collected food and clothing for the homeless.

The Chicago Relief and Aid Society opened homeless shelters and later provided materials for the building of small temporary houses. Business owners set up tables or carts and got back to work, and while many left the city as soon as possible, most stayed to rebuild.

The rebuilding went rather slowly. People resisted making changes that would prevent another fire, but gradually they realized the need for stricter building and fire-prevention rules. They built safer housing, and officials improved the fire department. Again, people had learned a hard lesson.



A "bird's-eye" view shows the size of the Chicago fire.



Photos of the ruins of Chicago made front-page news across the country.

Do You Know?

On the very same night as the Chicago fire, an even more destructive fire raged through the town of Peshtigo, Wisconsin. That summer, Peshtigo and the surrounding towns suffered through the same drought as Chicago. Forests had been cleared from the land by farmers and railroad workers. The resulting piles of dry wood and leaves had simply been left on the ground.

On the night of October 8, an enormous firestorm engulfed the entire region. Townspeople felt the ground shaking as tornado-force winds drove a wall of fire toward the town. In less than one hour, the entire town had vanished, leaving 800 of its 1,700 citizens dead. An estimated 1,200 people died in the forest fire, which leapt across Green Bay and burned parts of Michigan as well. It is still the most deadly natural disaster in U.S. history. Those who survived bore terrible physical and mental scars. But the Peshtigo fire has almost been forgotten because it happened to take place on the same night as the more famous, but less deadly, Chicago fire.



Today, even very small towns have well-equipped fire departments.

Conclusion

Today, we are lucky to live in a time when fire safety is given great importance. Every area of the country has strict fire codes, and professional and volunteer fire departments train in fire prevention, firefighting, and lifesaving techniques. Buildings have fire alarms and sprinkler systems, and firewalls are built between houses.

People learn from schools and the media what to do to prevent fires and how to plan for emergencies. Even with all this effort, terrible fires still occur. But because of modern fire prevention and firefighting, we hope to never see fires like the ones of Rome, London, and Chicago ever again.

Fire Safety Tips

Almost two million fires are reported in the United States every year. Fires can be deadly, so always follow these fire safety tips:

- Never play with matches, lighters, or flammable materials such as gasoline.
- Don't cook or use the stove unless you have permission and adult supervision.
- Don't put anything, including blankets or clothes, over lamps, radiators, or heaters. They could quickly catch fire.
- Make sure your family has at least one smoke detector on every floor of your home. It is especially important to have detectors near your bedrooms so they will be sure to wake you up in case of a fire. Test your smoke alarms every six months and replace the batteries at least once a year.
- Always keep a household fire extinguisher handy around any heat or flame in or near your home.

- Have a family fire escape plan. Go through your home and memorize at least two ways to get out of each room. Your escape may be through a door, a first-floor window, or a window with a safe escape ladder. Plan an easy-to-find meeting place a safe distance from the building, and put someone in charge of counting your family members to make sure you're all safe. Assign another family member to go to a neighbor's house to call 911. Make sure to practice your fire escape plan with your family. Knowing what to do in case of a fire will save time during an emergency, and it may save your life.



In case there is a fire in your home, follow these rules to get you and your family out safely and quickly:

- Get out as quickly as you can and go to your designated meeting place. Do not stop to get your things, no matter how valuable they are. Objects can be replaced. You cannot!
- Try to alert other family members as you are leaving. Yell "Fire!" and bang on doors as you pass.
- Smoke contains poisonous gases, and it can be hot enough to scorch your lungs. Since smoke collects near the ceiling, stay low. Crouch, or crawl if you have to. You can also use a damp towel or cloth around your mouth as a mask.
- Never go back into a burning building for any reason.
- If your clothing catches on fire, immediately stop, drop, and roll. If someone else's clothing is on fire, have him or her stop, drop, and roll right away. You can cover the person with a towel, blanket, rug, or cloth to help put the fire out.

To learn more about fire safety, check out this Internet link:

<http://www.usfa.fema.gov/kids>

Glossary

bucket brigades	lines of people who pass buckets from one to the other from a water source to a fire (p. 5)
firebreaks	areas that have been cleared of fuel and flammable material (p. 7)
fire hook	long, heavy hook used to pull down structures and create a firebreak (p. 10)
firestorm	a super-heated wind that carries fire over a large area (p. 17)
gasworks	factory that processes and pumps fuel (p. 16)
lax	relaxed; not strict (p. 15)
looting	widespread robbing of stores (p. 18)
militiamen	a group of volunteers that performs police duties (p. 11)
persecute	to mistreat a specific group (p. 8)
refugees	people who flee troubles, but with no place to go (p. 12)
slums	poor, crowded areas of a city (p. 15)
stockyards	place where livestock is slaughtered and processed into meat (p. 14)
thatched roofs	roofs made of straw (p. 9)
unruly	hard to control; disobedient (p. 6)

Name _____

INSTRUCTIONS: In the box under the name of each city, write two details that describe how its fire was different from the other fires. In the box at the bottom of the page, write four things that all three fires had in common.

Rome	London	Chicago
Different	Different	Different
Things in common		

Name _____

INSTRUCTIONS: Read the sentences below. Then place the different parts of the sentences in the appropriate column in the table below. You may not need to fill in every column for every sentence.

1. The boy gave his dog a bath on Saturday.
2. Mom and I are going shopping.
3. The great fires caused extensive damage and loss of life for hundreds of people.
4. I hit a stone with my skateboard and then fell over.
5. Her cat ate all of the ham in less than a minute.

Subject	Predicate	Object	Subordinate Phrases
1.			
2.			
3.			
4.			
5.			

Robinson Crusoe

A Reading A-Z Level Z Leveled Reader

Word Count: 2,972



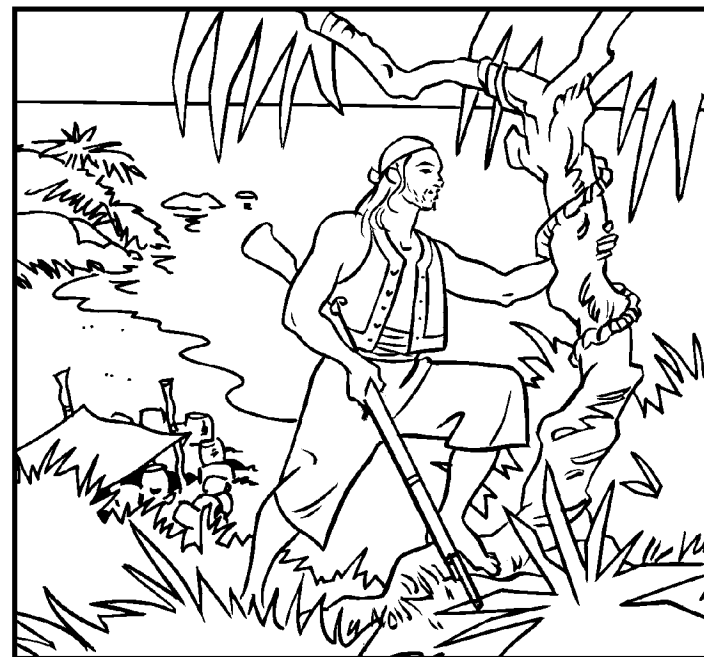

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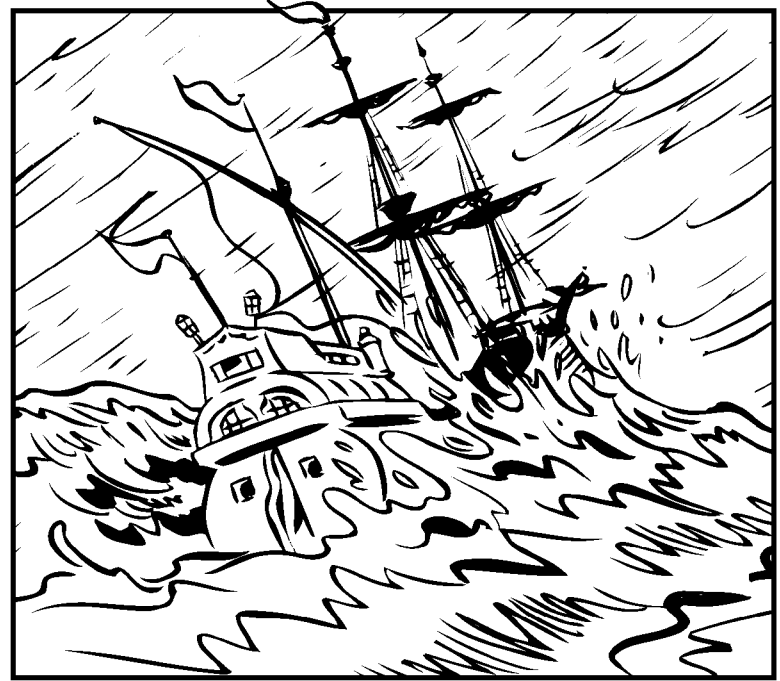
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Correlation

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Reading Recovery	29
DRA	N/A

Table of Contents

Shipwrecked	4
Luck	6
Afloat	10
Shelter	12
Storm	14
Home	16
Hope	20
Glossary	22



In this classic novel, Robinson Crusoe, an English sailor exploring the Caribbean and South America, becomes stranded on a tropical island when his ship is blown off course and wrecked. This part of the story opens when Crusoe finds himself alone on the island, the only member of the ship's crew to survive.

Shipwrecked

I looked to the stranded vessel, but the waves and froth of the sea being so big, I could hardly see it. It lay so far off. How was it possible I had gotten on shore?

After I had calmed my mind with the realization that I was alive, I began to look around to see what kind of place I was in. I soon had a dreadful shock, for I was wet, had no warm clothes to cover me, nor anything to eat or drink. Neither did I see any **prospect** before me except perishing with hunger or being eaten by wild beasts. This threw me into such misery that for a while I ran about like a madman. Night coming upon me, I began with a heavy heart to consider what would be my fate if there were any **ravenous** beasts in that country. At night, they always come out for their prey.

The only solution that entered my thoughts was to get up into a thick, bushy tree that grew near me. I **resolved** to sit all night and consider what death I should die, for I saw no prospect of life. I walked from the shore to see if I could find any fresh water to drink, which I did, to my great joy. Having drunk, I went to the tree, and getting up into it, tried to place myself so that if I should sleep, I might not fall. And having cut a short stick like a club for my defense, I took up my lodging. Having been extremely tired, I fell fast asleep, and slept as comfortably as few could have done in my condition.

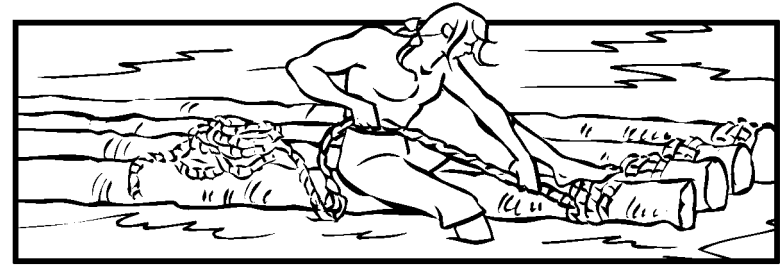


Luck

When I awoke, it was broad day, the weather clear, and the storm had stopped, so that the sea did not rage and swell as before. But what surprised me most was that the ship had lifted in the night. It was driven up almost as far as the rock that I mentioned, where I had been bruised by the wave dashing me against it. This was within a mile from shore, and the ship seemed to stand upright. I wished I were on board, so at least I might save some necessary things for my use . . .

A little after noon I found the sea very calm, and the tide **ebbed** so far out that I could come within a quarter of a mile of the ship. And here my grief returned, for I saw that if we had stayed on board, we would have been safe, and I would not be left entirely alone. This forced tears to my eyes again, but there was little relief in that. I resolved, if possible, to get to the ship. So I pulled off my clothes—for the weather was extremely hot—and took to the water. But when I came to the ship, I did not know how to get on board, for she lay high out of the water, and there was nothing within my reach to lay hold of. I swam round her twice, and the second time I spied a small piece of rope hung down low. With great difficulty I got hold of it, and by the help of that rope I got up onto the deck of the ship.

Here I found that the ship had a great deal of water in her hold, but she lay on the side of a bank so her **stern** lifted up, and all in that part was dry. You may be sure my first work was to search and see what was spoiled and what was free. First, I found that all the ship's **provisions** were dry and untouched by the water. Being very hungry, I went to the bread room and filled my pockets with biscuits, and ate as I went about other things, for I had no time to lose . . .

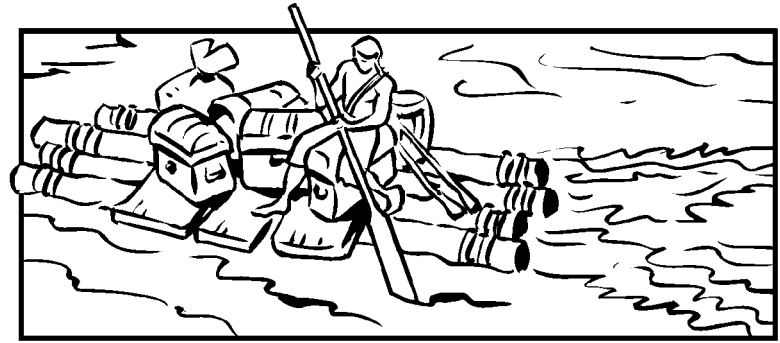


We had several spare masts in the ship. I resolved to work with these, and I flung as many of them overboard as I could manage. I tied every one with a rope, so they might not drift away. When this was done, I went down the ship's side, and, pulling them to me, I tied four of them together at both ends in the form of a raft. Laying two or three short pieces of plank upon them crossways, I found I could walk upon it very well . . . My raft was now strong enough to bear any reasonable weight.

Having considered well what I most wanted, I got three of the seamen's chests, which I had broken open and emptied, and lowered them down upon my raft. The first of these I filled with provisions—bread, rice, three Dutch cheeses, five pieces of dried goat's flesh, and a little bit of European corn. There had been some barley and wheat together, but, to my great disappointment, I found afterwards that the rats had eaten or spoiled it all.

While I was doing this, the tide began to rise, though very calmly. I had the **mortification** to see my coat, shirt, and waistcoat, which I had left on the shore, float away. However, this set me rummaging for clothes, of which I found enough. I took no more than I wanted for present use, for I had other things which I was more eager to get. The first things I wanted were tools to work with on shore. After long searching, I found the carpenter's chest, which was a very useful prize to me, and much more valuable than a shipload of gold would have been at that time.

My next thought was for some ammunition and arms. There were two very good hunting rifles in the cabin, and two pistols. I knew there were three barrels of powder in the ship, but knew not where our gunner had stowed them. With much search I found them, two of them dry and good, though the third had taken water. The dry two I got to my raft. And now I thought my raft pretty well loaded, and began to think how I should get to shore, having neither sail, oar, nor rudder. The least capful of wind would have overturned my raft.



Afloat

I had three encouragements—first, a smooth, calm sea; second, the tide rising; third, what little wind there was blew me toward land. And thus, having found two or three broken oars, I put to sea. For a mile or thereabouts my raft went very well, only that it went a little distant from the place where I had landed before. I noticed that there was some movement of the water, and I hoped to find some creek or river, which I might use as a port. As I imagined, so it was. There appeared a little opening of the land, and I found a strong current of the tide set into it. I guided my raft as well as I could, keeping in the middle of the stream.

But here I almost suffered a second shipwreck, which, if it had, I think would have broken my heart. My raft ran aground at one end upon a **shoal**, and not being aground at the other end,

the smallest wave would send all my cargo off into the water. I did my best to set my back against the chests to keep them in their places. But even with all my strength, I could not free the raft. I dared not stir from the posture I was in, holding up the chests with all my might.

I stood in that manner near half an hour, in which time the rising of the tide floated my raft again. I at length found myself in the mouth of a little river, with land on both sides, with a strong current of tide running up. I looked on both sides for a proper place to get to shore.

At length I spied a little cove on the right shore of the creek, to which with great pain and difficulty I guided my raft. At last I got so near that, reaching ground with my oar, I could pull her in. But here I almost dropped all my cargo into the sea again, for that shore lay pretty steep, and there was no place to land. If one end of my float ran on shore it would lie so high, and the other sink so low, that it would spill my cargo again. All that I could do was to wait till the tide was high, keeping the raft near shore with my oar. As soon as I found water enough, I thrust her upon a flat piece of ground, and there fastened her. Thus I lay till the tide ebbed away and left my raft and all my cargo safe on shore.

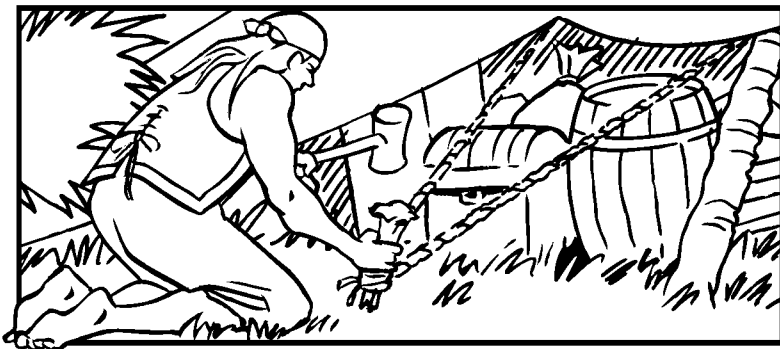


Shelter

My next work was to view the country and seek a proper place for shelter and to stow my goods. Where I was, I knew not, whether on the continent or an island, inhabited or not inhabited, in danger of wild beasts or not. There was a hill not more than a mile from me, which rose up very steep and high. I took one of the hunting rifles and a horn of powder, and thus armed, I traveled up to the top of that hill. After great labor and difficulty, I got to the top. I saw, to my great **affliction**, that I was on an island surrounded on all sides by the sea. No land to be seen except some rocks, which lay a great way off, and two smaller islands, which lay about three **leagues** to the west . . .

Having seen this, I came back to my raft, and fell to work to bring my cargo on shore, which took up the rest of that day. What to do with myself at night, I knew not. I was afraid to lie down on the ground, not knowing if some wild beast might eat me, though I afterwards found no need for those fears. I went to work to make a little tent with a sail and some poles. Into this tent I brought everything that I knew would spoil either with rain or sun. I piled all the empty chests and **casks** up in a circle round the tent, to **fortify** it from any sudden attack, either from man or beast.

I now began to consider that I might get a great many things that would be useful to me out of the ship. I knew that the first storm might break her all in pieces. I resolved to put all other things off till I had got everything out of the ship that I could get . . .



Storm

I had been now thirteen days on shore, and had been eleven times on the ship. I had brought away all that one pair of hands could bring. I believe, had the calm weather held, I should have brought away the whole ship, piece by piece. But the twelfth time I went on board, I found the wind began to rise. I thought nothing more could be found, yet I discovered a locker with two or three razors and one pair of large scissors, with some ten or a dozen of good knives and forks. In another I found money—some European coin, some Brazilian, some gold, and some silver.

I smiled to myself at the sight of this money. "Money!" said I, aloud, "what are you good for? You are not worth anything to me—no, not worth taking off the ground. One of those knives is worth all this heap."

I began to think of making another raft, but while I was preparing this, I found the sky overcast, and the wind began to rise. In a quarter of an hour it blew a fresh gale from the shore. It occurred to me that it was in vain to make a raft with the wind blowing out to sea. It was my business to be gone before the tide began, otherwise I might not be able to reach the shore at all. Accordingly, I let myself down into the water, and swam across the channel. Even that was difficult, partly with the weight of the things I had, and partly the roughness of the water. The wind rose very hastily. Before long, it blew a storm.

But I had got home to my little tent, where I lay with all my wealth about me, very secure. It blew very hard all night, and in the morning, when I looked out, behold, no more ship was to be seen! I was a little surprised, but thought to myself with satisfaction that I had lost no time getting everything out of her that could be useful to me. Indeed, there was little left in her that I might have brought away if I had had more time. I now gave up any more thoughts of the ship, or of anything out of her, except what might float on shore from her wreck. Indeed, pieces of her did, but those things were of small use to me.



Home

I soon found that the place I was in was not fit for my settlement, because it was upon low, marshy ground, near the sea. I resolved to find a more healthy and convenient spot of ground. I thought of several things I needed: first, healthy and fresh water; second, shelter from the heat of the sun; third, security from danger, whether man or beast; fourth, a view to the sea. If there were any ship in sight, I might not lose any chance of escape.

In search of a proper place, I found a little plain on the side of a rising hill whose front was as steep as a house-side. Nothing could come down from the top. On the side of the rock there was a hollow place, worn a little way in, like the entrance or door of a cave, but there was not any cave.

On the flat, just in front of this hollow place, I resolved to pitch my tent. This plain was less than a hundred yards broad, and about twice as long, and lay like a lawn before my door. At the end, it descended down into the low ground by the seaside. It was on the north side of the hill, so it was sheltered from the heat every day till near sunset.

Before I set up my tent, I drew a half-circle in front of the hollow place. In this half-circle I pitched two rows of strong stakes, driving them into the ground till they stood very firm. The biggest end stood out of the ground five and a half feet, and was sharpened on the top. This fence was so strong that neither man nor beast could get into it or over it. This cost me a great deal of time and labor.

The entrance into this place I made, not by a door, but by a short ladder to go over the top.

When I was in, I lifted the ladder over after me, and so I was completely fenced. I slept secure in the night, which otherwise I could not have done, though I realized afterwards, there was no need of all this caution.

Into this fence or fortress, with **infinite** labor, I carried all my riches, all my provisions, ammunition, and stores. I made a large tent to protect me from the rains. I made a smaller tent within, and covered the top tent with a large **tarpaulin**, which I had saved among the sails. And now I lay not in the bed that I had brought on shore, but in a hammock, which was indeed a very good one, and belonged to the mate of the ship.





When I had done this, I began to work my way into the rock. Thus I made a cave, just behind my tent, which served me like a cellar to my house. Having now fixed my shelter, I found it absolutely necessary to provide a place to make a fire in, and fuel to burn. What I did for that, and how I enlarged my cave, I shall tell in its place. But I must now give some mention of myself, and of my thoughts about living.

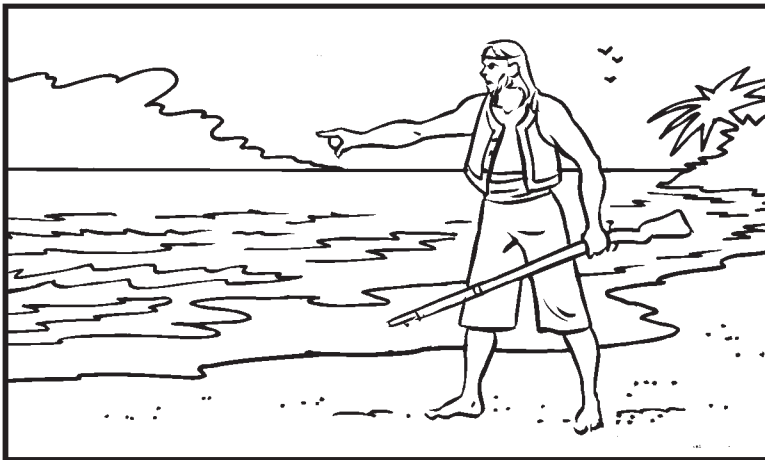


Hope

I was cast away upon that island after having been driven by a violent storm. We were quite out of the course of our intended voyage, and some hundreds of leagues out of ordinary trade routes. I had great reason to consider it my fate that in this **desolate** place, and in this desolate manner, I should end my life. The tears would run plentifully down my face when I had these thoughts. Sometimes I would ask myself why I was so absolutely miserable, so without help, abandoned, so entirely depressed. It could hardly be reasonable to be thankful for such a life.

But something always turned around inside me and stopped these thoughts. Particularly one day, walking by the seaside, I was very sorrowful about my present condition. But I thought to myself, "Well, you are in a desolate condition, it is true. But, pray remember, where is the rest of your crew? Did not eleven of you come in the boat? Where are the other ten? Why were they not saved, and you lost? Why were you singled out? Is it better to be here or there?" and then I pointed to the sea. All evils are to be compared with the good that is in them, and with what worse might have been.

If you would like to read more of Robinson Crusoe's adventures, ask your librarian for the book Robinson Crusoe, by Daniel Defoe.



Glossary

affliction	pain; distress (p. 12)
casks	barrels that holds liquid (p. 13)
desolate	empty, alone, and unwelcoming (p. 20)
ebbed	flowed back into the sea (p. 7)
fortify	made strong as a defense (p. 13)
infinite	endless; going on forever (p. 18)
leagues	unit of measure; about 5 km or three miles (p. 12)
mortification	extreme embarrassment (p. 9)
prospect	future; the predicted outcome (p. 5)
provisions	food supplies (p. 7)
ravenous	starving; violently hungry or greedy (p. 5)
resolved	decided (p. 5)
shoal	high ground under the water that is dangerous to boats (p. 10)
stern	the back end of a boat (p. 7)
tarpaulin	a sheet of waterproof fabric (p. 18)

Name _____

INSTRUCTIONS: Write a summary for each main event in the book. Make sure to place the summaries in the order in which they happened.



First
Robinson Crusoe's ship is wrecked, and he is the only survivor.



Second



Third



Fourth



Fifth



Sixth



Seventh

Name _____

INSTRUCTIONS: Add the suffixes *-ion*, *-tion*, *-ation*, or *-sion* to create new words. Use the new words in sentences.

Word	Word + Suffix	Sentence
promote	promotion	He worked hard and got a promotion.
discuss		
decide		
observe		
associate		
occupy		
decorate		
combine		

Name _____

INSTRUCTIONS: Read the sentences from the story. Substitute a synonym that makes sense in place of the word in bold. Use the glossary from the book if needed.

Sentences	Replacement Sentences
1. I resolved to sit all night and consider what death I should die.	I decided to sit all night and consider what death I should die.
2. I saw no prospect before me except perishing with hunger.	
3. First, I found that all the ship's provisions were dry and untouched by water.	
4. I had the mortification to see my coat, shirt, and waistcoat, which I had left on the shore, float away.	
5. Into this fortress, with infinite labor, I carried all my riches.	
6. For a mile or thereabouts my raft went very well.	
7. I piled up all the empty chests in a circle to fortify my tent.	
8. I saw to my affliction that I was on an island surrounded on all sides by the sea.	
9. I resolved to find a more healthy and convenient spot of ground.	
10. I had great reason to consider it my fate that in this desolate place, and in this desolate manner, I should end my life.	

Native Americans of the Great Plains

A Reading A-Z Level Z Leveled Reader

Word Count: 2,145



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Table of Contents

The Great Plains	4
Home on the Plains	6
Where Buffalo Once Roamed	8
Horses, Weapons, and War	11
Celebrations and Rituals	12
The Indian Wars	15
Leaders	17
The Plains Native Americans Today	20
Glossary	23
Index	24



The Great Plains

The Great Plains of the United States stretch from the Rocky Mountains in the west beyond the Missouri River in the east. The Great Plains extend north into Canada and south nearly to Mexico.

Long ago the Great Plains were characterized by gently rolling hills covered with tall grasses. With few trees to block them, strong winds whipped across the Great Plains, blowing hot in the summer and bitterly cold in the winter. It was dry, with rainfall averaging 20 inches (51 cm) a year.

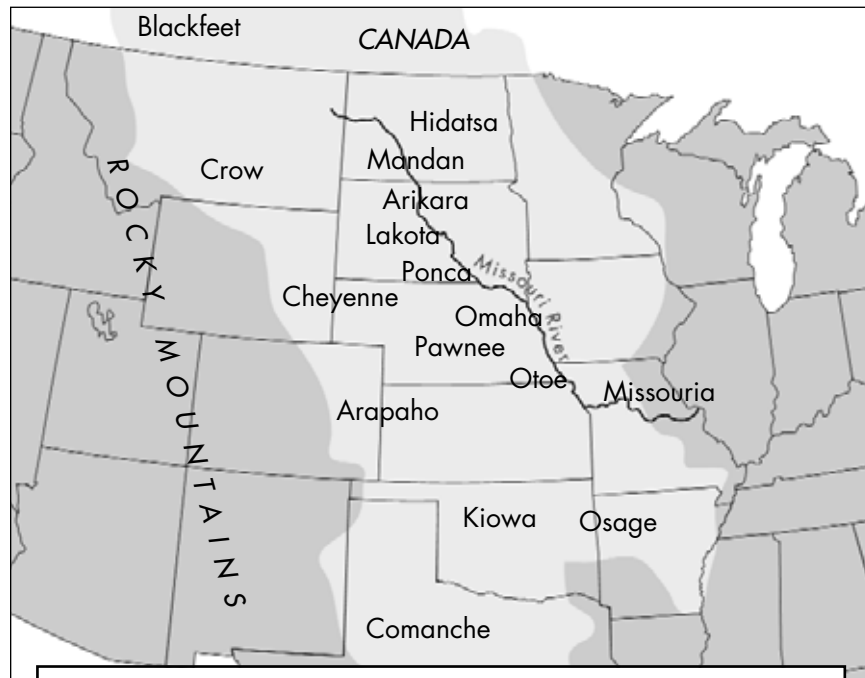
A little over two hundred years ago, in the early 1800s, there were only 150,000 people living in the Great Plains. Most were Native Americans, but there were also European settlers.

People shared the Great Plains with more than sixty million **bison**, or buffalo. Bison were the mainstay of many Plains tribes' diets, which meant that as the animals **migrated**, or moved with the seasons, many of the tribes moved with them. As you read about the people who lived on the Great Plains, you'll see how they depended on the bison for more than food.

Home on the Plains

Lots of people think of **teepees** as typical homes for Native Americans of the past, and many Plains tribes actually did live in teepees. These amazing mobile homes were ideal for **nomadic** hunters on the Plains because they were designed to be strong enough to withstand heavy winds, provide heat in the winter, and let air flow through in the hot summer months.

Wooden poles gave the teepee its cone shape, and some of the poles were 25 feet (7.6 m) tall. Bison hides were stitched together to make the walls. The poles and hides that made the teepee could be quickly taken down and then transported to a new location. Once a tribe decided where to settle, two to three people could set up a teepee in less than two hours.



Tribes of the Plains

There are more than thirty tribes that make up the Plains Native Americans. The tribes of the Great Plains all have different languages and customs, but they also have much in common based on geography.



A Plains tribe family outside their home

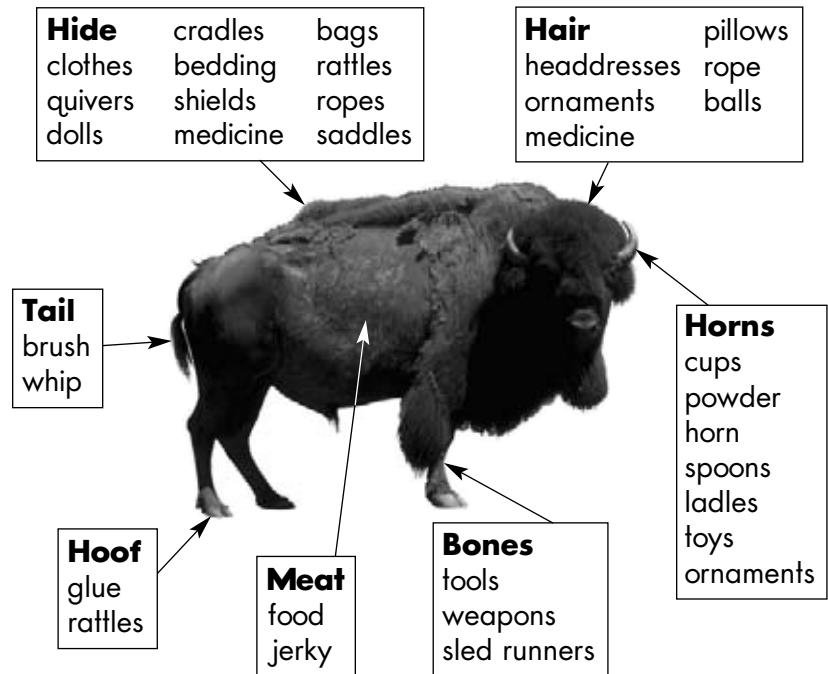


Teepees have small entrances so it's easy to keep the weather out.

A large family could comfortably live in a teepee, which had a living area about 15 feet (4.57 m) in diameter, with enough room to cook during the day and sleep at night. The opening often faced east because there was less wind coming from the east. When cooking or heating the inside, a smoke flap near the top could be opened to let smoke escape, or closed to keep heat in the teepee during the long, cold winter months.

Not all Plains tribes lived in teepees. Village tribes—such as the Pawnee, Omaha, and Mandan—built more permanent shelters. These shelters were built long and low to the ground so that they could better withstand the strong winds that whipped across the **prairie**. Wood, bison skins, grass, and mud were combined to make homes and lodges. Large families lived and cooked in the lodge, and there was even enough room inside for a horse and the family's dogs.

Making the Most of a Bison



Where Buffalo Once Roamed

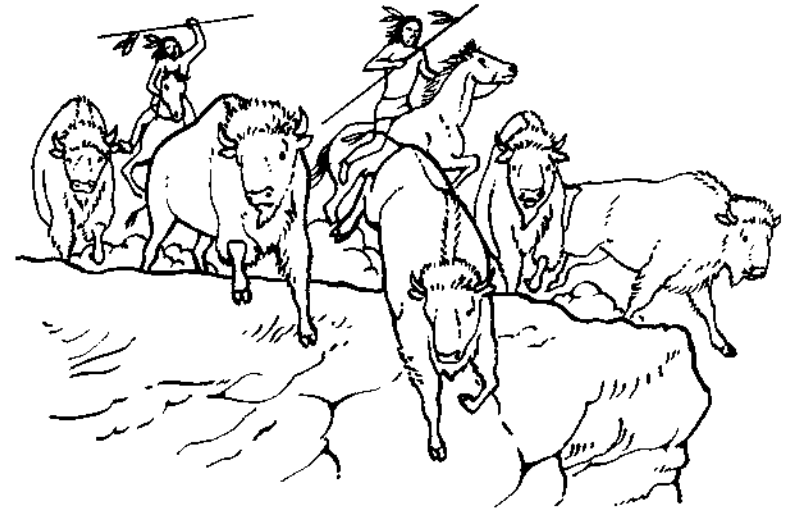
Bison provided meat, shelter, and tools for many tribes in the Plains. Tribes found uses for all parts of the bison. Almost every part was eaten, including the organs. Bison skin was made into clothing, blankets, shoes, shields, and teepees. Their horns were made into spoons or scoops, or used as **ornaments**. Bison bones were used to make all kinds of tools, weapons, and everyday objects, including runners on children's sleds.

In the fall, bison gathered in huge herds—often of more than one million. Fall was the best time for hunting, and village tribes had their annual hunts at that time. Nomadic tribes would gather in larger groups, setting up camps and celebrating the **bounty** of the bison hunt.

Hunters rode out from camp on their horses until they found the bison herd. They would ride toward the herd until the bison started running. Then the hunters would ride right alongside the animals, spearing them or shooting them with either bows and arrows or guns. Bows were made of wood, with bowstrings made of bison **tendons**.



Plains Native Americans used many weapons to kill bison. Horses made it easier, no matter what weapon was used.



Herds of bison were chased off cliffs to their deaths, but Native Americans would kill only as many as they needed.

The hunters were able to shoot the bison with amazing accuracy while their horses were galloping full-speed through the herd. Sometimes a large group of people riding horses would chase the bison off a cliff, so that the bison fell to their deaths.

When winter came, the bison would break up into smaller herds, and nomadic tribes broke up into smaller groups, too. Nomadic tribes followed the bison migration throughout the year while many tribes living in farming villages stayed in one place for the entire year. During the winter months, they lived off the big bison hunt and the crops they harvested.

Horses, Weapons, and Wars

Before Europeans brought horses to the United States in the 1500s, nomadic tribes moved and hunted on foot. Spanish explorers introduced horses in the southwestern United States, and the horses quickly ran wild throughout the Plains. Through trade (and stealing), more tribes began acquiring horses. By the 1700s, horses were fully a part of the Plains Native American lifestyle, and everything changed when people had the speed and power of these four-legged beasts. Members of the Plains tribes became excellent horsemen, and they rode horses into bison hunts and into wars.



Horses are an important part of the Plains tribes' lifestyles.

Some of the Plains tribes had reputations as warring tribes. Most of the battles were small, often fought to steal horses from another tribe or to **avenge** a death. War was seen as a way to restore honor. As the U.S. Army and other settlers moved west, they posed a threat to the livelihood of the Plains tribes, who fought for their right to hunt, farm the land, and preserve their traditions.



Sun Dance

Celebrations and Rituals

Members of the Plains tribes often gathered to sing, dance, and celebrate with friends. One important ceremony was the Summer Sun Dance. The Sun Dance was different from tribe to tribe, but all Sun Dance celebrations focused on thanking the Great Spirit for plentiful food. Because bison was an important food source, it was featured in Sun Dances.

A Sun Dance lasted for several days with nonstop dancing. Dancers also shook their heads and looked into the sun as long as their eyes could **endure** it, which could hurt them. They hoped they'd have a vision at the end of the Sun Dance and that prosperity would come to their tribe.

Even today, dances of celebration are important to many tribes. One of those dances is the Grass Dance (or Omaha Dance), which started around 1860 in the Omaha tribe, possibly as a warrior dance. Modern dancers wear outfits with lots of fringe and ribbon to look like the movement of prairie grass. Early dancers of the Grass Dance may have tied grass to their clothes. Some tribes used the Grass Dance to flatten the grass before larger tribal ceremonies; others used it to celebrate victory over an enemy. Now, the Grass Dance is performed in tribal competitions.



Do You Know?

The sound of drums played a powerful role in celebrations and rituals. Many drums were handed down in a family from one generation to the next and were often named and blessed. Older drums were made of deer, elk, horse, or bison hides stretched over hollowed-out sections of logs.



The Ghost Dance started among Lakota, or Sioux (sue), tribes who were forced onto reservations by the United States government. The Ghost Dance recalled days when there were millions of bison and food was plentiful. It also told of a hoped-for time when all the settlers would be dead, and the Native Americans would have their land back. This dance scared the settlers who were moving into the Great Plains.



Battle at
Wounded
Knee

Do You Know?

On December 29, 1890, U.S. Cavalry troops at Wounded Knee (in what is now South Dakota) were guarding a large group of Lakota people who had surrendered. When the Lakota began performing the Ghost Dance, it provoked the soldiers, and a bloody battle broke out. During the battle, two hundred Lakota were killed by the Army. The murdered Lakota—including men, women, and children—were buried in a mass grave. It was the last battle between the Army and tribal people.



This depiction shows a U.S. Army troop fighting a Plains Native American tribe.

The Indian Wars

As settlers from the Eastern United States began moving onto the Plains to mine, farm, and build towns and railroads, they came in conflict with the Plains tribes. The Plains tribes and the settlers fought over the land, and there was killing on both sides. Settlers demanded that the U.S. Army defend and protect them. The government sent troops to fight the Plains tribes, and those battles became known as the Indian Wars.

The Plains tribes sometimes even matched the soldiers. The tribes knew the land well, and they used **guerrilla** (ger-RIL-la), or secret, warfare against the soldiers. But the U.S. Army outnumbered the tribes, and the Army had more powerful guns than the tribes had.

However, the main reason that the Plains tribes eventually lost the wars was probably not the soldiers. By the time the U.S. Army reached many of the tribes, more than half the people had died from diseases, such as smallpox. Settlers had brought diseases to the Plains—diseases that the Indians' bodies did not have **immunity**, or resistance, to.



Settlers spread disease to Native Americans when they traded goods.

The settlers and soldiers also killed most of the bison on the Plains, and without the bison, many tribes were left without the food and materials they needed to survive. The U.S. Cavalry used the method of running bison off a cliff to kill hundreds of thousands of bison at a time, leaving them to rot. By the late 1800s, most of the bison were gone.

Eventually, soldiers and settlers forced most of the Plains tribes onto **reservations**, or areas of land set aside for them. Often the areas were small and were the poorest farming or hunting land in the Great Plains.

Leaders

Leaders of the Lakota tribes resisted the U.S. government's efforts to put their people on reservations. Three of the most well known were Sitting Bull, Crazy Horse, and Red Cloud.

Sitting Bull was known as a courageous leader who fought to protect tribal lands.

When gold was discovered in South Dakota in the mid-1870s, a rush of **prospectors** invaded tribal lands. In 1876, the U.S. government sent troops to protect the prospectors and ordered all Lakota to move to reservations. Sitting Bull refused. He called together other Lakota as well as Arapaho and Cheyenne tribes, and they gathered at Little Bighorn Valley.

On June 25, 1876, George Armstrong Custer of the U.S. Army led his troops into the valley intending to ambush the Lakota, but Sitting Bull and his warriors were ready. The bloody battle ended with the death of Custer and his soldiers. The Battle of Little Bighorn is sometimes called Custer's Last Stand.



Sitting Bull

Crazy Horse, who was known as Tashunka-witko, (ta-SHUN-ca-weet-co) was known as a ferocious warrior who fought to preserve the traditions of the Lakota. Crazy Horse stole his first horse before he was thirteen and led his first war party when he was still a teenager.

When the U.S. government ordered all Lakota bands onto reservations in 1876, Crazy Horse resisted and led other Lakota to resist, just as Sitting Bull did. After almost a year of battles, Crazy Horse saw that his people were struggling with the lack of bison too much to continue fighting. He was the last major chief to surrender.

Crazy Horse died in 1877. He did not allow any photographs to be taken of him, but his likeness is carved into the side of a mountain in South Dakota at the Crazy Horse Memorial.



Crazy Horse Memorial



Red Cloud

Red Cloud, whose tribal name was Makhpiya-Luta (Ma-KAP-ee-a-loo-ta) was an important Lakota leader who led wars against tribes of Crows, Pawnees, Utes, and Shoshones. In 1866, Red Cloud began a series of attacks to protect Lakota land from miners traveling into Montana. To end the attacks, the Fort Laramie Treaty, which stated that the Lakota would abandon the warpath in exchange for money and goods, was signed. As part of the treaty, Red Cloud's Lakota band was supposed to stay only on reservation land. Although Red Cloud is said to have signed the treaty (marked with an "X"), there's little evidence that the terms of the treaty were fully explained to the Lakota leader.



Lakota Sioux children at powwow ceremony

The Plains Native Americans Today

Today, people from many Plains tribes come together to preserve their traditions. They hold tribal celebrations, practice speaking their native languages, and work to increase the number of bison.

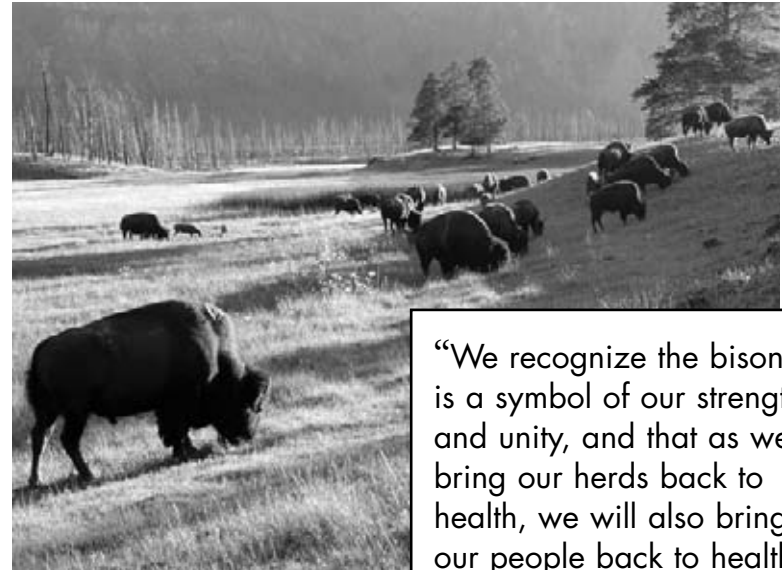
Native Americans gather together across the country for **powwows**, which are a way to preserve their heritage through dance, music, arts, crafts, and food. Traditional dances have now become contests for prizes in addition to being done to celebrate a bountiful harvest or other occasion.

Many native languages, like the Lakota's, are disappearing because young people don't learn to speak or use them. Thirty years ago, many Lakota children in reservation schools spoke the same language as their grandmothers, grandfathers, and many generations of elders.

One problem with learning the Lakota language is not knowing how to pronounce some words. People working on The Lakota Language Project at the University of Indiana created computer software that students can use to see and hear all the different ways a Lakota word might be pronounced. The program also shows ways a word might be used in different communities.



Lakota children use computers to learn the language of their tribe.



The bison population is growing, but the numbers don't come close to the sixty million that once lived.

"We recognize the bison is a symbol of our strength and unity, and that as we bring our herds back to health, we will also bring our people back to health."

—Fred DuBray,
Cheyenne River Sioux

To preserve another ancient tradition, more than forty tribes, including Lakota, Blackfoot, and Crow, came together to form the Intertribal Bison Cooperative. Some of the tribes were enemies hundreds of years ago, but now they are united in their efforts to bring bison back to the Great Plains. The bison reminds today's tribes of how their ancestors lived in harmony with nature; the animals also represent the spirit many tribes are trying to preserve. More than 8,000 bison have been reintroduced to tribal lands through the InterTribal Bison Cooperative's efforts.

Glossary

avenge	get back at someone or something for a wrong (p. 11)
bison	cow-like animal with shaggy mane (p. 5)
bounty	great wealth of goods (p. 9)
endure	to live through something painful (p. 12)
guerrilla	secretive warfare (p. 15)
immunity	resistance to disease (p. 16)
migrated	moved with the seasons (p. 5)
nomadic	moving from place to place (p. 6)
ornaments	decorations (p. 8)
powwows	celebrations that include dance, music, arts, crafts, and food (p. 20)
prairie	flat land with gently rolling hills and tall grasses (p. 7)
prospectors	people searching for gold or other precious metals (p. 17)
reservations	land set aside for Native Americans (p. 16)
teepees	tent-like homes used by Plains tribes (p. 6)
tendons	cord that connects muscle to bone (p. 9)

Index

Arapaho, 5, 17	Lakota, 5, 14, 17, 18, 19, 21, 22
Battle of Little Bighorn, 17	Mandan, 5, 7
bison, 5, 6, 7, 8, 9, 10, 12, 13, 14, 16, 18, 22	Missouri River, 4, 5
Blackfoot, 5, 22	nomadic, 6, 10, 11
buffalo, 5	Omaha, 5, 7
Cheyenne, 5, 17	Pawnee, 5, 7, 19
Crazy Horse, 17, 18	powwows, 20
Crow, 5, 19, 22	Red Cloud, 17, 19
Custer, George Armstrong, 17	reservation(s), 14, 16, 19
diseases, 16	Rocky Mountains, 4, 5
drums, 13	Shoshone, 19
DuBray, Fred, 22	Sioux, 14, 22
European settlers, 4, 11	Sitting Bull, 17
Ghost Dance, 14	South Dakota, 14, 17, 18
Grass Dance (Omaha Dance), 13	Sun Dance, 12
herd(s), 9, 10	teepee, 6, 7
horse(s), 7, 9, 10, 11	U.S. (Army) Cavalry, 11, 14, 15, 16, 17
hunt(ers), 6, 9, 11	Utes, 19
InterTribal Bison Cooperative, 22	village tribes, 7
	war, 11, 15, 16
	Wounded Knee, 14

Name _____

INSTRUCTIONS: Write the main ideas and important details for each of the chapters listed on the chart.

Chapter Title	Main Idea	Important Details
Where Buffalo Once Roamed		
Horses, Weapons, and War		
Celebrations and Rituals		
The Indian Wars		
Leaders		
The Plains Native Americans Today		

Name _____

INSTRUCTIONS: Before reading, write what you know or think each word means. After reading the book, make a ✓ if your prediction was correct, or write the correct meaning of the word.

Vocabulary Prediction Chart

Word	Before Reading: Predicted Meaning	After Reading: Was the Meaning Correct?	After Reading: Revised Meaning
avenge			
bison			
bounty			
migrate			
nomadic			
powwows			
prospector			
reservations			
teepees			

Talking to Each Other

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Word Count: 2,449



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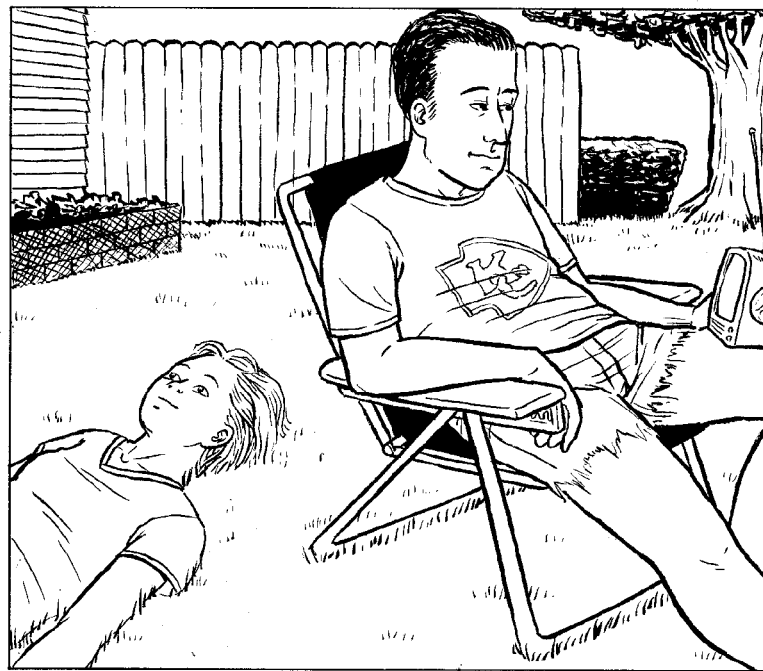
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Fountas & Pinnell	V
Reading Recovery	29
DRA	N/A



Even though Chris and Amanda spent a lot of time together, they never talked. Amanda didn't mind this much. In her opinion, people talked too much. That went for the girls at school, commercials on television, and even Mom sometimes, though that wasn't a nice thing to think. She suspected that Chris thought people talked too much, too, which was why they let the silence lie when they were alone together.

"Amanda! Get your shoes on. We need to go shopping," Mom yelled from the back door.

"Haaw. . ." Amanda groaned. She was lying in the grass, staring straight up at the treetops and imagining she was floating on her back in her very own swimming pool. Chris sat in a lawn chair near her, watching the football game on the little black and white TV with the rabbit ears and the twist-dial channel changer. Kansas City was losing, but coming back strong, and Amanda didn't want to leave with ten minutes still on the clock.



"You hear me?"
Mom shouted again, her
voice coming through
the windows along with
the jingle of her keys.

"I hate shopping,"
Amanda said.

"You'll hate starting
school in worn-out
clothes even more,"
Mom chimed back.



"I like my clothes. I'm just going to wear out
the new ones anyway," Amanda said.

Amanda felt a nudge on her leg. Chris had
tapped her with his sneaker. He nodded toward
the house, letting her know that she should stop
arguing and go with Mom. Amanda sighed, got
up, and headed inside.

"I'll let you know," Chris said, meaning the
score of the game. When he did talk, it was like
that—short and direct, without a single extra
word. She thought to herself that when she got
home, it would be like that again. He'd say,
"Twenty-one, fourteen," without introducing it
or explaining what he meant. But she'd get it.



In the car, Mom nervously sipped her iced tea.
Then she started talking.

"What's up, baby doll? How've you been?"
she asked. Amanda wasn't sure how to answer.
She saw Mom after work every day. Was there
anything new she should report? "How's your
summer going?" Mom pressed.

"It's going okay."

"Are you disappointed that you couldn't go to camp?"

"No." Amanda had gone to Lake Pines Summer Camp for the past two summers, but Mom couldn't afford to send her this year after she and Chris paid for their wedding. Amanda didn't mind at all. For the past two years, her counselor had told her that the woodworking class she wanted to take was "just for boys."

"Mom, is there something you need to tell me?"

Mom sighed. "I don't know, honey. Things don't seem to be going like I imagined." She paused. Amanda knew that unlike Chris, Mom would always go on to explain what she meant, even if Amanda had already guessed. "I mean with Chris," Mom said.

"I like Chris. I like having him around," Amanda said.

"Well, I do, too, honey, but just being around isn't enough sometimes," Mom said. "You haven't talked about this with him, have you? No, you guys don't talk about anything," she said, answering her own question.

"No. We don't really need to talk," Amanda said.

The car stopped at a light and Mom took a deep breath in and out. "Well, I need someone to talk to. Another grownup. And Chris just. . . well. . ." Mom trailed off. Amanda felt bad about having thought that her mother talked too much.

"Are you getting a divorce?" Amanda asked. Amanda was very familiar with divorce. Mom and Dad had gotten one when Amanda was barely three years old—so young that she didn't even remember. Then there was Mom's boyfriend, Chuck, with his blonde mustache and all his action figures. He was fun, and even though he and Mom were never married, it still hurt like a divorce when he left. Even Gram and Gramps were divorced, though they lived in the same building and still shouted at each other from their porches the way they had when they were married.

Mom started to sniff a bit, and she didn't answer. They pulled into a space in the MegaMart parking lot, and Mom reapplied her makeup in the rearview mirror before they got out and went inside the store. They shopped for hours before heading back home.

"We lost," was all Chris said when Amanda and Mom got home. Their shopping bags were filled with new, itchy clothes. As usual, Mom had tried to get Amanda to try on the pink shirts with all the ribbons and ruffles, but Amanda insisted on plain colors—red, blue, and green, and nothing girly. Amanda was going to ask what the score was, but if they'd lost, it really didn't matter much. Across the street, she saw her neighbor Cameron on a big pile of dirt, planting a stick into the top like a flagpole on a mountain.



"Going out to play," she shouted as she ran to join Cameron. The dirt pile had been left there when the town dug holes for new telephone poles, and the work crews had never come back to take it away.

"Where were you?" Cameron asked.

"School shopping," Amanda said.

"Did you get any cool stuff?" Cameron asked. "My mom said I could save my paper route money and get a graphing calculator."

"No, just clothes."

"Hmm." Cameron started absentmindedly smacking the dirt pile with his stick. Amanda had had plans for the dirt pile. She'd wanted to make a fort by hollowing out the inside and building a long, low window facing the street. Then she was going to plant jungle-like plants all over the top to camouflage it. But Cameron never put up much of an effort, and he tore down half of what they'd done each time she went to Dad's for a weekend.

"You will be going to Hogan Elementary, right? Now that your mom and Chris are married, you'll definitely be staying here and not going to your dad's for the school year, right?"



"Who knows how long they're going to be married," Amanda said. She dug some loose dirt out of what had almost been the entrance to their fort.

"Are you serious?" Cameron asked.

"That's what Mom said. She said that it wasn't like she imagined, and when I asked if they were getting divorced, she didn't say anything."

Cameron began carving channels down the side of the pile. "Hey, don't be mad at me when I say this," he said. He wiped his mouth with the back of his hand. "I never really liked Chris all that much. Chuck was more fun. Remember when he got all those bottle rockets for the Fourth of July?"



"I guess he was sort of more fun," Amanda said. "But Chris and I are more alike. We understand each other."

"He seems kind of grumpy sometimes," said Cameron.

"Well, I do, too," said Amanda, suddenly feeling kind of grumpy at Cameron. She didn't really hang out with

him at school—just during summers, when they were the only kids in the neighborhood.

"I'm going to get an ice pop," Amanda said, without even bothering to offer Cameron one.

"Finished your fort?" Chris asked when she stepped inside the house. He had the big TV taken apart all over the living room floor. It had been like that for a week now, but Amanda found that she liked watching Chris fix the TV almost as much as she had liked watching TV.

Amanda knelt down next to the disassembled screen. "No. It never gets anywhere."

Chris pointed at the big TV tube. "Radioactive," he said. "Can't put it in the trash."

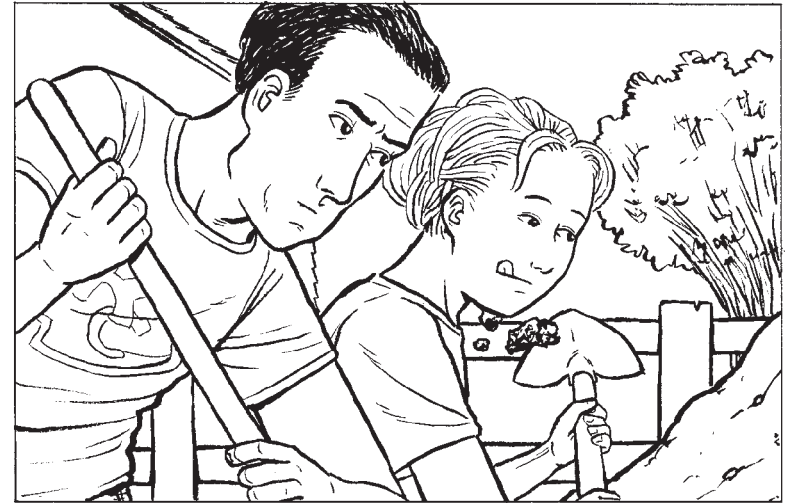
"Dangerous?" she asked.

"Not unless it's broken. You need help?"

She knew he was talking about the fort.

"Sure."

"Let's go," Chris said. And out they went.



Cameron was creating some kind of battlefield in his yard. He looked up and watched them, but didn't act as if he wanted to join.

Chris and Amanda worked on the fort all that day. By nightfall, Amanda could get her whole body, except for her feet, inside the hollow they had carved. By the end of the weekend, Chris could crawl inside. By Wednesday, they leveled off the top so the roof wouldn't cave in.

"An arch is the strongest shape," Chris said. On Thursday, the ceiling took on a curve. By Friday, there was a long, narrow spy window looking out over the neighborhood. Cameron came by and helped smooth out the insides and level the floor.

Saturday morning, Amanda asked Mom if they could go to the plant store and buy some ferns and potted tropical trees to plant all over the fort.

"Absolutely not," she said.

"But, Mom—"

"First of all," Mom began, and Amanda rested her weight back on her heels in preparation for the lecture, "that dirt belongs to the city crew, not to us. Second, it's not even in our yard. Third, plants are expensive and we can't afford to buy them as toys. Fourth, they're just going to come along with bulldozers and smash the thing anyway."

"But the pile's been there for almost a year! It's almost done—it's the coolest thing." Amanda said.

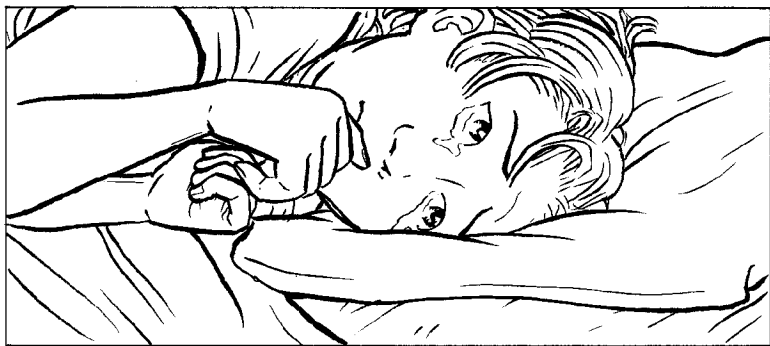
"Don't interrupt me. You've spent every day out there in the mud, ruining the clothes we bought for school."

Amanda stuck out her bottom lip. "Chris may not talk a lot, but he sure knows me better than you do."

As soon as Amanda said it, she waited for Mom to be furious and start yelling at her. But instead, Mom's mouth just opened a little and she stared at Amanda with huge eyes. She didn't even cry.

"Go to your room," Mom said. Her voice sounded flat.





Amanda almost never cried, and she tried not to now, but there was already mud on her pillow—her tears had picked up dirt from her cheeks. She heard Mom moving pots around, getting ready to start dinner. She knew that Mom’s mouth would be moving silently as she worked, as it always did when she was upset. Talking, talking, always talking. Every time Amanda thought about what she had said to Mom, she couldn’t figure out whether she was sorry or whether she had just been telling the truth.

She heard Chris go around the side of the house, turn on the hose, and rinse the dirt off his hands. That was another way that Amanda and Chris were different from Mom, but like each other. Amanda and Chris were always getting dirty doing things like working on the car, fixing the water heater, or putting in a new back step. Mom was always complaining about dirty hands.

After the hose stopped, Chris’s footsteps went around the house and inside.

“Where’d she go?” he asked.

“Who?” Mom said. There was another thing—Amanda and Chris always had to explain to Mom what they meant, but they always understood each other. Mom was always explaining things to them even after they got it.

“Amanda,” Chris said.



Mom's voice got quiet, and Amanda couldn't hear what she said. They spoke back and forth for a moment, and then Chris's footsteps went down the hall to their bedroom. Amanda didn't hear anything but kitchen sounds for a while, so she figured that no one was going to come and talk to her after all. But then she heard the doorknob turn, and Chris came in.

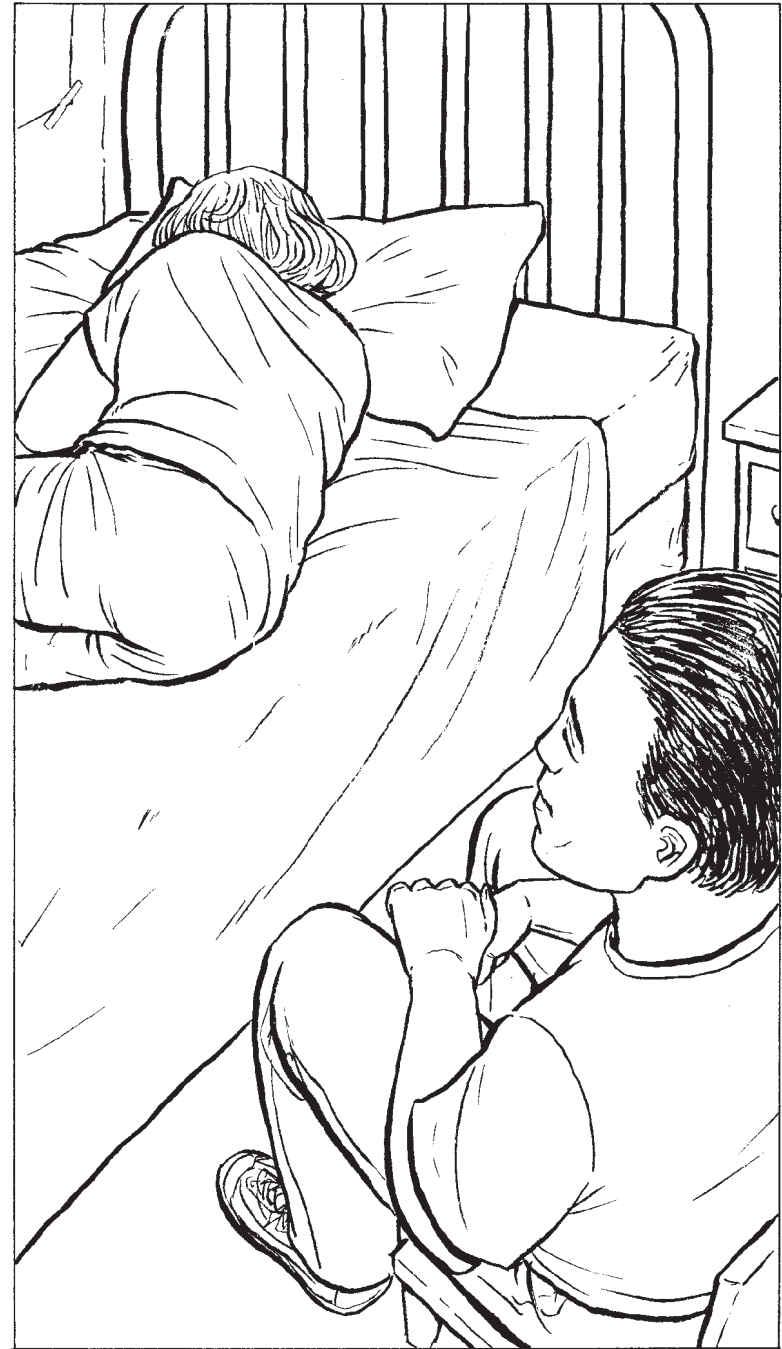
Chris didn't say "Hello," or start asking her if she wanted to talk, like Mom always did. Amanda even found herself wondering why she couldn't just stay with Chris if he and Mom did get a divorce. He sat down in the chair by her bed. She didn't roll over to face him, and he didn't speak for a long time.

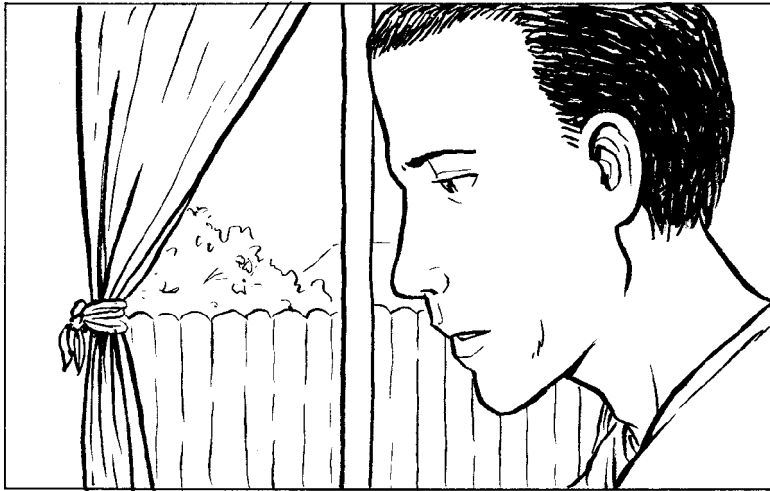
"You hurt your mom when you said that," he said. Amanda felt her tears start running down her cheeks again. She wiped them away, not wanting to get more dirt on her covers.

"She doesn't understand me," she said, whispering so that Chris wouldn't know she was crying.

"She knows what's best for you, and she loves you," Chris said.

"Then why can't she—"





"Sometimes people have a hard time talking to each other," Chris said. Amanda had to think about that for a minute. She knew it was true—she and Mom often did have a hard time talking to each other. She thought it was awfully strange that Mom, who talked so much, would find it difficult to talk to anyone.

Suddenly Amanda began to understand something about Mom: maybe talking was her way of trying to figure things out. Whenever Mom was giving her a talk or asking her too many questions, she really just wanted to understand. Amanda had never thought that she was particularly hard to understand, but then again maybe she was. She never really told Mom much of anything.

"I guess you understand Mom pretty well, don't you?" she asked Chris.

"I haven't been too great about it lately," he said. "She needs to get some feedback once in a while. And you need to apologize. Families have to work at staying together."

Amanda didn't nod or say anything. She knew Chris would realize that he had made his point. After a short time, he got up and left the room, closing the door behind him. Amanda sat up, blew her nose, and got ready to clean herself up to talk to Mom.





"Three pickup trucks, five cars, a telephone van, two dogs, and a snapping turtle," Cameron said, reading from a sheet of paper. "Those are all the things that passed by the fort window today, and not one of them knew I was in here. This place is great! Where have you been?" he asked. Amanda had just arrived at the dirt pile.

"Mom and I went to get our nails done," Amanda said.

"Really? So we can't plant the vines after all, since you won't want to mess your nails up." Cameron sounded disappointed.

"No. I made a deal with my mom. I would go and have a 'salon day' with her if she came outside and helped us plant camouflage this afternoon."

"No way!"

"Watch out!" came a voice from outside the dirt fort. Suddenly, a splash of water came in through the window. Mom was dragging the hose across the road. "Can't plant things if the soil's not wet!" She aimed the sprayer right in the fort, and Cameron and Amanda ran outside, muddy and wet, screaming with laughter.



Name _____

INSTRUCTIONS: Write what you learned from the characters' thoughts, words, and actions on each of the pages listed.

Character Analysis

	Thoughts	Words	Actions
Amanda Pages 6–7			
Pages 12–13			
Page 18–19			
Page 21			
Chris Page 5			
Page 13			
Pages 18–19			
Amanda's mother Pages 6–7			
Page 15			
Page 24			

TALKING TO EACH OTHER • LEVEL Z • 1

SKILL: CHARACTER ANALYSIS

Name _____

INSTRUCTIONS: Write three different sensory words under each of the five senses. Then use two of the words in each column in complete sentences for each sense.

Hear

Smell

See

Touch

Taste

silent

rotten

sparkly

fuzzy

bitter

Hear 1. _____

2. _____

Smell 1. _____

2. _____

See 1. _____

2. _____

Touch 1. _____

2. _____

Taste 1. _____

2. _____

Satellites

A Reading A-Z Level Z Leveled Reader

Word Count: 1,836

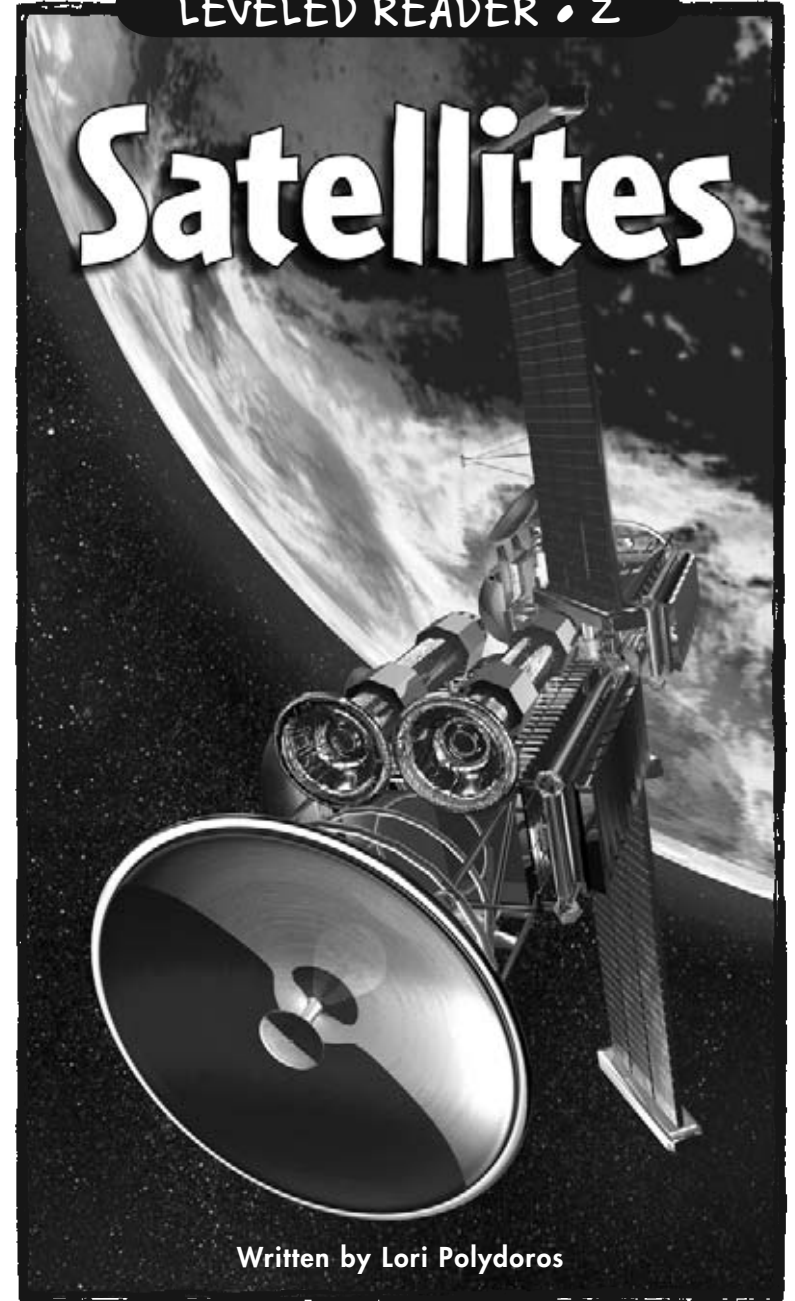



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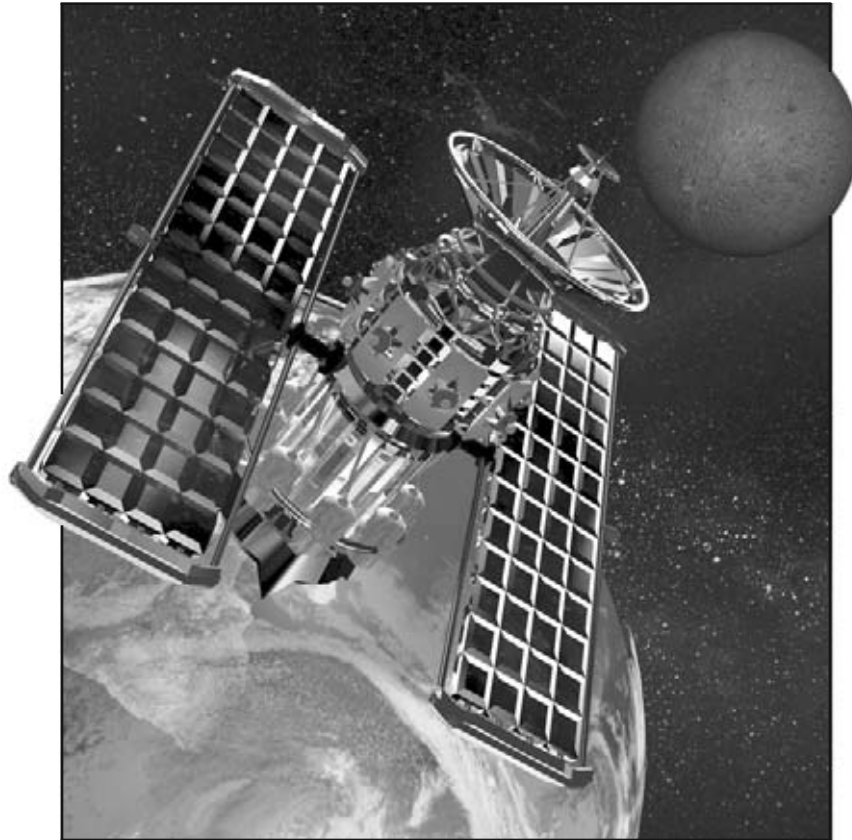
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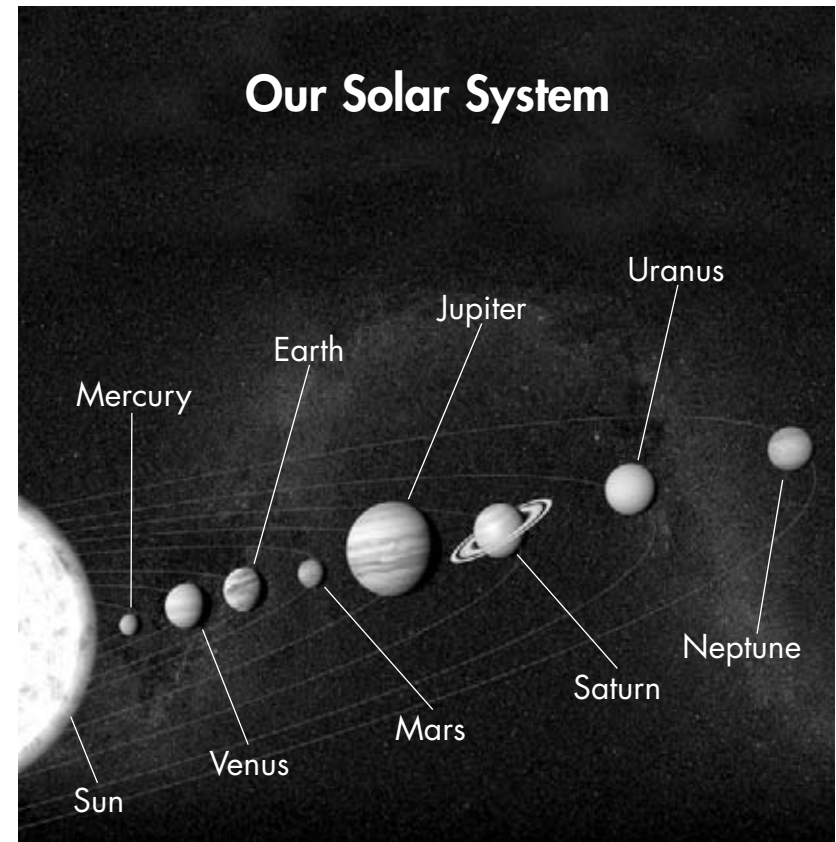
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Fountas & Pinnell	V
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DRA	N/A



Table of Contents

Introduction to Satellites	4
Satellite Anatomy	6
Outstanding Orbits.....	8
Satellites Work.....	11
First Satellites.....	18
The International Space Station	19
Satellite Rescue	20
Satellite Funerals.....	21
Glossary	23
Index	24



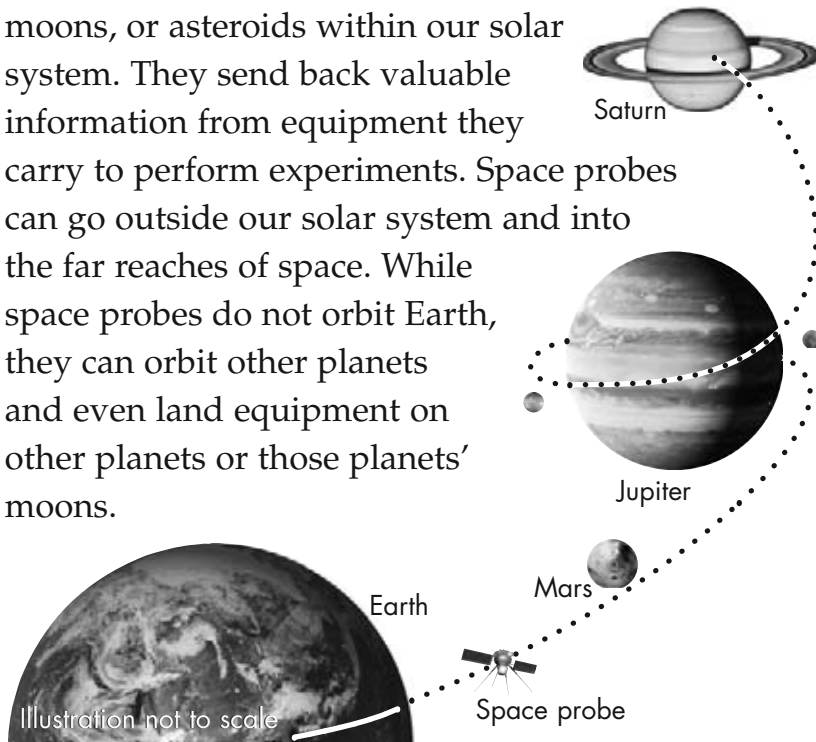
The eight planets of our solar system are satellites that orbit the Sun.

Introduction to Satellites

A satellite is any object in space that **orbits**, or revolves around, another object. There are two kinds—natural and artificial satellites. The Moon is a natural satellite that revolves around Earth. All of the planets in our solar system are natural satellites of the Sun. **Artificial satellites** are made by humans.

Artificial satellites are high-tech tools that orbit Earth. They are like space robots that do many jobs people can't. They have played an important part of our lives for almost 40 years, even though we often aren't aware of them and can't see them. Artificial satellites allow us to do everyday things, like use our cell phones, watch more than 100 TV channels, and even predict dangerous storms! Thousands of satellites now orbit Earth.

Not all objects sent into space are Earth-orbiting satellites. Similar to satellites are space probes, which usually explore other planets, moons, or asteroids within our solar system. They send back valuable information from equipment they carry to perform experiments. Space probes can go outside our solar system and into the far reaches of space. While space probes do not orbit Earth, they can orbit other planets and even land equipment on other planets or those planets' moons.

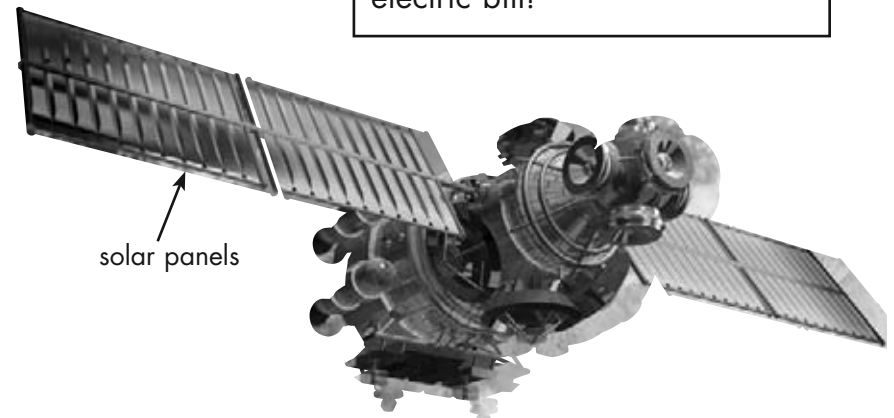


Satellite Anatomy

Satellites are built for specific jobs. They may look like a barrel or a windmill and have paddles or sails. Most artificial satellites have the same parts inside even though they may look different on the outside. The **payload** includes whatever tools the satellite needs to perform its work, such as antennas, cameras, electronics, and more. The **bus** is the part that carries the payload. The bus holds all the parts together; it provides the electrical power, the computers, communication equipment, and the power to move the satellite forward.

Solar Sensation

Satellites can always count on the Sun to provide power. Satellites use **solar energy** to run the instruments. The flaps, wings, panels, or the satellite's shell can be covered with solar cells. These cells convert the Sun's energy to electricity. A satellite *never* has to pay an electric bill!



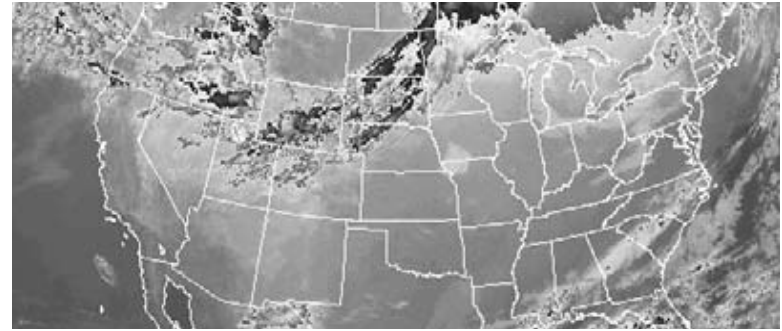
Linking Up and Down!

Downlinking is when a satellite converts the information it collects into a radio signal and sends it back to Earth. These signals travel through space and are received at an **Earth Station**, or dish. Sending signals back up to a satellite is called uplinking.



A collection of Earth Stations are arranged to receive satellite signals.

Computers function as the satellite's brain. The computers receive information, interpret it, and send messages back to Earth. Television cameras serve as the satellite's eyes. Sensors are other important parts that recognize light and color, heat, water, minerals, and gases. Sensors record changes in what is being observed. Radios on the satellite send information back to Earth where antennas receive the signals.



In Low Earth Orbit, satellites can snap detailed images of Earth's atmosphere and weather.

Outstanding Orbits

Artificial satellites use **gravity** to stay in their orbits. The Earth's gravity pulls everything toward the center of the Earth. To stay in Earth's orbit, a satellite's speed must balance with the pull of the Earth's gravity. The satellite's speed works against Earth's gravity just enough so that the satellite doesn't go speeding into space or falling back to Earth.

Rockets carry satellites to different types and heights of orbits, based on the jobs they need to do. Satellites closer to Earth are in **Low Earth Orbit**, which can be 200–500 miles (321–804 km) high. Gravity is stronger closer to Earth, so these satellites must travel at about 17,000 miles per hour (27,358 kph) to keep from falling back to Earth. Satellites farther away from Earth can travel slower because gravity isn't as strong.

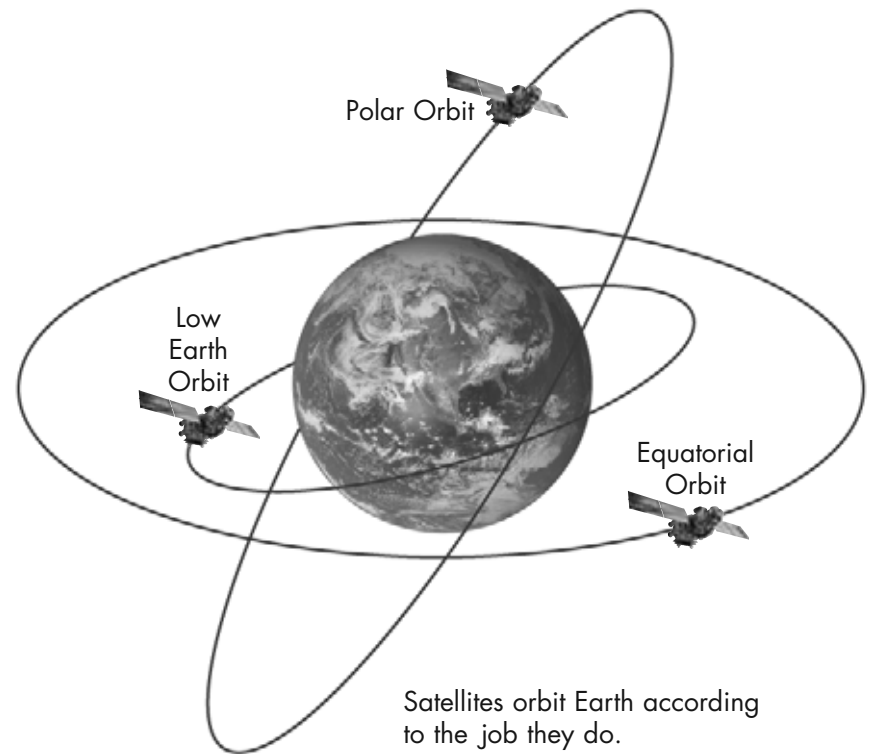
Hunks of Junk!

A space shuttle traveling in Low Earth Orbit smacked into a fleck of paint that dug a pit in a window nearly a quarter-inch (6.35 mm) wide! Space might seem empty, but what's really out there is an orbiting garbage dump—leftovers from early space missions such as gloves, lens caps, bolts, rocket motors, and meteoroids, too. These objects can slam into spacecraft at speeds of 170,000 mph (273,588 kph) or more, and can cause serious damage. The U.S. Space Command has logged over 7,000 pieces of space junk bigger than a baseball. In 1984, NASA launched a satellite to study the impact of space junk. It came home after six years with billions of impacts from running into space junk!



Mirrors on this satellite were broken in orbit by space junk.

Satellites that follow a lopsided **elliptical**, or oval-shaped, orbit do so to get a closer view of the Earth. At 540 miles (869 km) up, satellites in **Polar Orbit** travel from pole to pole and circle the Earth 18 times a day! Other satellites orbit over the equator 22,300 miles (35,888 km) up. They move as fast as the Earth is turning. These satellites are in stationary orbits, meaning it takes 24 hours for the satellite to circle our planet. The Earth takes 24 hours to spin on its axis, so these satellites appear to stay over the same spot!



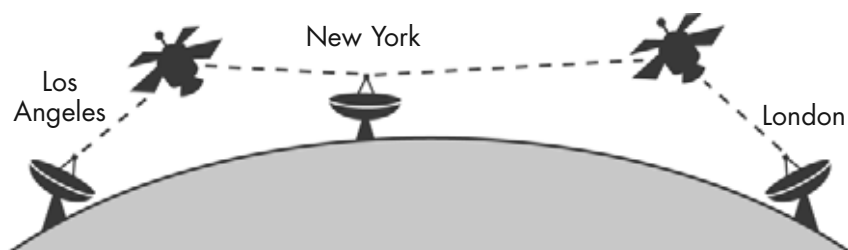
Satellites orbit Earth according to the job they do.

Satellites Work

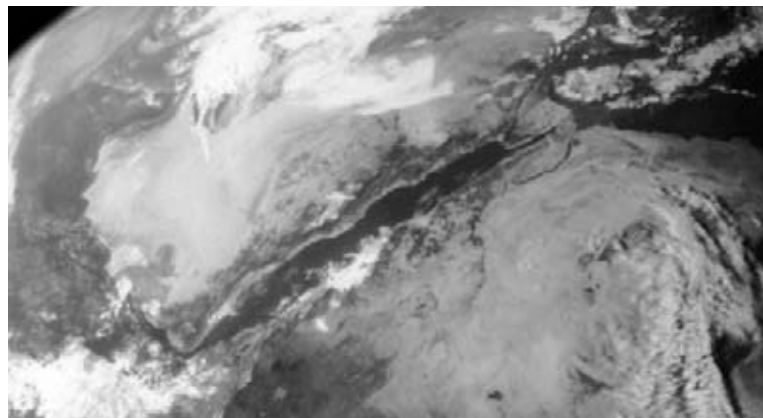
Satellites provide different kinds of information. Scientists design and place them into orbit according to what kind of data they collect.

Communication satellites, or comsats, allow us to use cell phones and send emails and faxes across the globe. They allow us to broadcast TV and radio programs around the world, and even allow us to make phone calls while flying in a plane!

Today, signals from telephone calls, TV pictures, or Internet connections are bounced off satellites to get from one place in the world to another. To reach extreme distances, signals must be bounced off more than one satellite.



Dishes such as this one receive TV programs from satellites.



Environmental satellites can show how Earth's atmosphere changes over time.

Earth observational satellites collect information on temperature, the oceans, wildfires, animals, and even volcanoes! Sometimes these satellites are called **environmental satellites**. They record changes in the Earth's surface and atmosphere, such as pollution and destruction of forests, caused by people. Powerful satellite cameras take pictures using light rays, X-rays, radio waves, and other types of waves. Environmentalists, farmers, miners, and fishermen find this information very helpful.

Other satellites such as **military**, or spy, **satellites** have taken pictures of Earth for more than 35 years. They were made to spy on other nations. Spy satellites, or spysats, relay coded messages, monitor nuclear weapons, observe enemy armies, and eavesdrop on all Earth communication.

Strategic Defense Initiative (SDI or STAR WARS)

President Ronald Reagan announced that the U.S. government was developing a space-based system to shoot down enemy missiles in 1983. Satellites orbiting Earth would detect heat from enemy missiles that could be destroyed by powerful lasers, X-rays, and particle beams. The system was never completed.

Scientists are discovering other ways to use spysats. Industries can use them to find oil or mineral sites. Law enforcement uses them to find where illegal drugs are grown. Spysats have even traced pollution back to the polluters. Spy satellites have helped us map Earth in greater detail than we could ever do before.

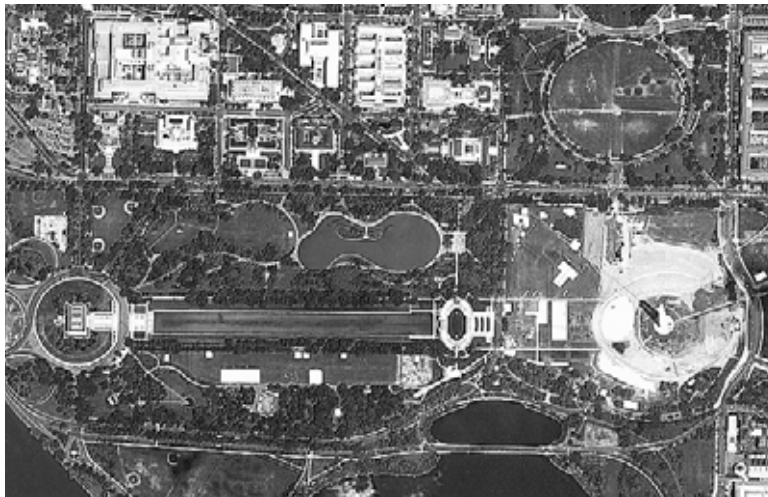


Image of Washington, D.C., taken from a spy satellite

Satellites in Emergencies

Both communication and military spy satellites are important in major emergencies. Disasters often destroy all means of transportation and other forms of communication, but satellite signals are not affected.

Radio and TV stations use mobile satellite dishes as ground stations. This allows signals to be sent up to a communication satellite, which then beams the signal around the world or bounces it off to another satellite.



A satellite image shows the direction winds are blowing a wildfire. These images can help firefighters to put out the fire.



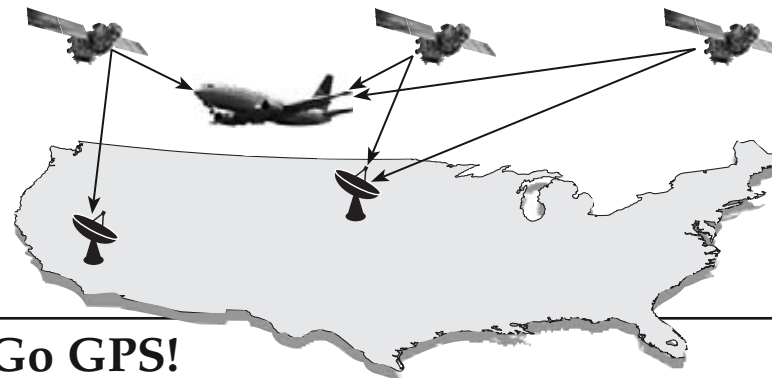
A satellite's view of a hurricane

Weather satellites save lives. They are on the lookout for weather systems, wind speeds, rainfall, and much more. Weather satellites track dangerous storms, such as hurricanes or typhoons. People in the path of these storms have time to prepare for them or escape them because of weather satellites. **Meteorologists**, scientists who study the Earth's atmosphere, weather, and climate, can make better forecasts using satellites.

Weather satellites use instruments to measure temperature and wind currents in the atmosphere. They can help ships in the ocean by detecting storms and ice at sea.

Working Together

Meteorologists use weather satellites in different orbits to help them make the best observations. Two satellites circle Earth over the poles. Another set of these satellites orbit Earth at the equator.



Go GPS!

The government developed GPS for military use, but now people across the globe use this satellite technology to determine where they are. Many cars now have GPS monitors that can direct drivers from one place to the next. But GPS isn't perfect—it can be disturbed by electrical storms, solar flares, and computer or power failures!

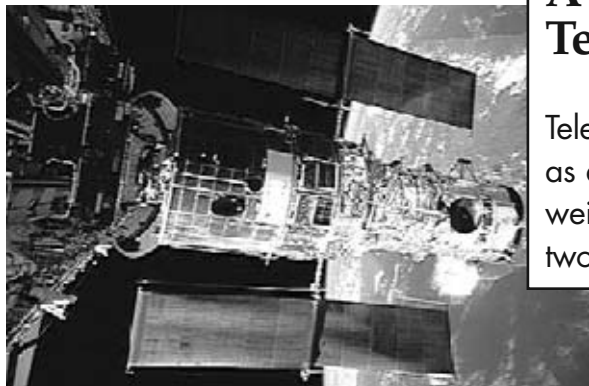
Large ships and planes use **navigational satellites** to help them find their way. The Global Positioning System, or **GPS**, receives radio signals from a series of 24 satellites that are used to pinpoint an exact location anywhere on Earth.

Astronomical satellites have the ultimate view of the universe! They look deep into space at the Moon, Sun, planets, stars, and galaxies. Scientists use these research satellites to study waves and particles moving through space in the hope of understanding more about our universe. Infrared satellites have suggested that our universe could contain more matter than scientists thought.

The Hubble Space Telescope is the most famous astronomical satellite. It was launched in 1990 by a space shuttle and travels in Low Earth Orbit at about 380 miles (611 km) up. At its low orbit, the space shuttle is able to service the Hubble about every three years.

On the Hubble, reflecting telescopes, high-powered cameras, sensors, and other tools act as “eyes” to the universe. The Hubble has helped scientists understand star birth and death, black holes, and the evolution of galaxies with more than 100,000 images recorded in eight years.

Soon the Hubble will need repairs, but NASA won’t send a shuttle to fix it, saying it’s too risky. Other plans have been considered to fix the dying satellite. The Hubble will send data to comsats for relay to the ground until its batteries run out near 2008.



A Tremendous Telescope!

The Hubble Space Telescope is as long as a school bus and weighs as much as two elephants!

First Satellites

Scientist Isaac Newton came up with the idea for an artificial satellite in 1687 after realizing that the Earth’s gravity held the Moon in its orbit. The former Soviet Union took Newton’s advice almost 300 years later when it launched the first object into space, the satellite Sputnik I.

Sputnik I was about the size of a basketball and had four antennas that sent out radio signals. It circled Earth in 98 minutes. The launch of Sputnik I surprised the United States and began the space race between the two countries.

In response to the Sputnik satellites, the United States launched Explorer I. The space age had begun, and in 1958 the National Aeronautics and Space Administration, NASA, was born in the United States.

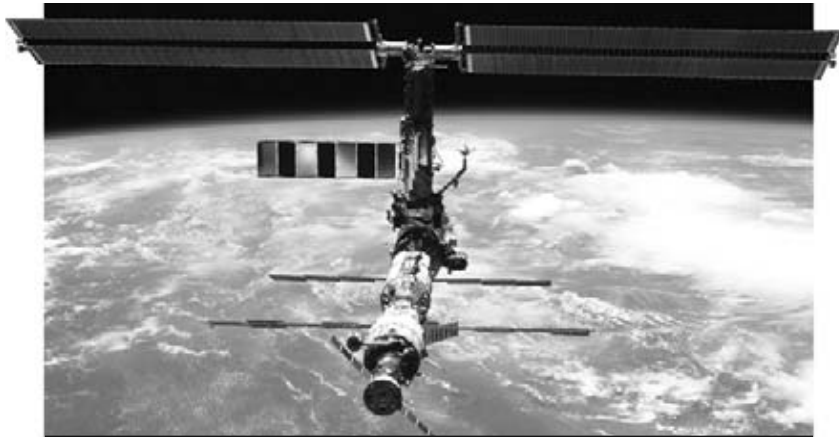


Living Cargo

To prove that living creatures could survive in space, the Soviet Union sent Laika, a dog, on its second satellite, Sputnik II, in 1957. Laika became the world’s first space traveler. Sadly, Sputnik II was not made to return to Earth.

The International Space Station

In 2000, the first crew boarded the International Space Station, or ISS, the newest and largest thing in space—as long as two football fields! Space stations allow astronauts to live and work while orbiting Earth. Before the ISS, the Russian space station, Mir, was the largest and most famous space station ever built. The International Space Station is four times bigger than Mir with almost an acre of solar panels to power it!



Space Partners

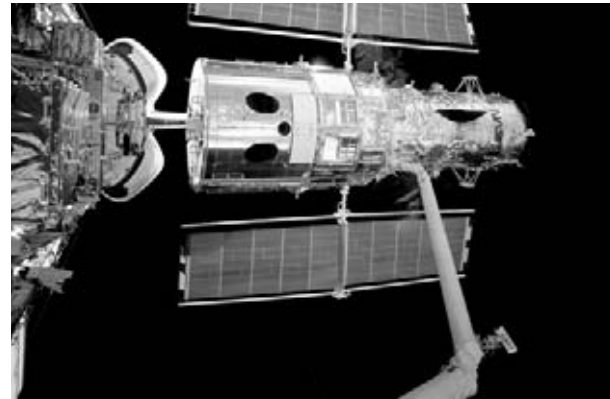
The International Space Station is a joint effort of 16 countries: the United States, Canada, Japan, Russia, 11 countries from the European Space Agency, and Brazil. Each partner contributes important elements: Japan is building a laboratory, Canada is providing a 55-foot (16.76 m) robotic arm, and Russia is building two research areas.

ISS travels in Low Earth Orbit about 250 miles (402 km) up, which allows people to get to it easily with launch vehicles, such as a space shuttle. ISS can make excellent Earth observations because it covers 85 percent of the globe at this orbit.

The ISS has the most state-of-the-art laboratory in orbit. Scientists hope to make many discoveries that will help people all over the world. Some of the research will include: testing for new AIDS vaccines, testing the effects of long-term low gravity on humans, and long-term observing of Earth's environment.

Satellite Rescue

After the Columbia space shuttle was launched in 1981, satellite rescue missions became easier. Technology on board the shuttles



The Hubble Space Telescope is adjusted in orbit by astronauts in the space shuttle.

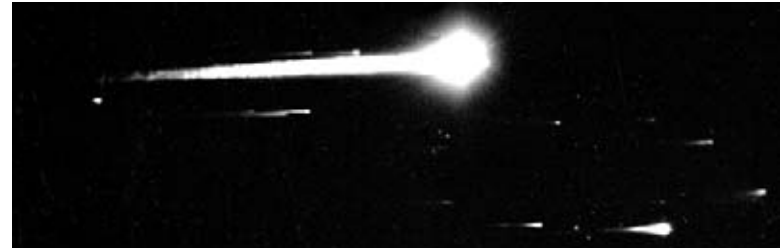
improved the chances of success. Manned Maneuvering Units, which look like legless chairs strapped to an astronaut's back, allowed astronauts to move freely outside the spacecraft without being tied to the ship. Shuttles also had giant robotic arms to reach out and grab satellites and put them into the space shuttle's cargo bay. They could then be released into other orbits.

Satellite Funerals

Space is a busy place, especially with space junk and thousands of aging satellites in Low Earth Orbit. Currently there is no law that says old satellites must be removed from their orbit.

A satellite uses on-board fuel to make sure it doesn't drift out of its orbit. When the fuel runs out, satellites are usually left in space. Objects in orbit above 500 miles (804 km) can stay there for thousands of years! Over time, satellites in some orbits get pulled back into Earth's atmosphere where they often burn up before reaching the ground. NASA and other agencies are working on ways to remove aging satellites.

The European Space Agency is considering using old satellites as relay stations for weather, traffic, and news reports, and music signals that can be directly picked up by a car antenna.



Apollo 8, a manned U.S. spacecraft, reenters Earth's atmosphere after orbiting the moon.

Satellites are clearly here to stay. Plans are in the works for new satellite technology that will change our lives even more. One idea is a global communications network that could extend the functions of the Internet into space! This would be very useful to people in remote areas that have no telephone or Internet access.

Researchers are also creating software that would make highly detailed satellite images a practical tool for everyone, such as farmers or transportation workers.

Improving satellite technology adds greatly to scientific knowledge. Satellites make it possible for us to communicate information quickly to people all over the world. Satellite images help us to come up with better ways to protect our planet. Research satellites will continue to probe our galaxy, helping us unravel the mysteries of the universe.

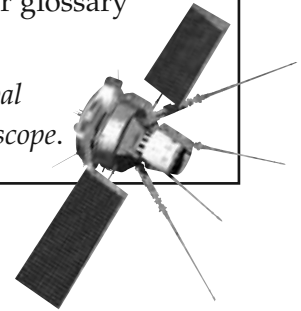
Glossary

artificial satellites	human-made objects that orbit other objects in space (p. 4)
astronomical satellites	research satellites to monitor waves and particles in deep space (p. 16)
bus	the body of a satellite, contains basic functions and equipment (p. 6)
communication satellites	satellites that pick up sound, picture, and telephone signals (p. 11)
Earth station	receives signals from a satellite (p. 7)
environmental satellites	satellites that monitor how the Earth is changing (p. 12)
GPS	Global Positioning System, uses radio signals from satellites to pinpoint locations (p. 16)
gravity	the Earth's force that pulls everything to its center (p. 8)
Low Earth Orbit	an orbit close to the Earth, 200–500 miles (321–804 km) high (p. 8)
meteorologists	scientists that study the Earth's atmosphere, climate, and weather (p. 15)
military spy satellite	satellites that gather information about other countries (p. 12)
navigational satellites	satellites that help ships and planes know where they are (p. 16)
orbits	the paths of objects around others (p. 4)
payload	part of a satellite that carries tools (p. 6)
Polar Orbit	orbiting the North and South poles (p. 10)
solar energy	power from the sun (p. 6)
weather satellites	satellites that monitor weather (p. 15)

Explore More

On the Internet, use *www.google.com* to find out more about the topics presented in this book. Use terms from the text, or try searching for glossary or index words.

Some searches to try: *satellites*, *Global Positioning System*, or *Hubble Space Telescope*.



Index

artificial satellites, 4–6, 8, 18	military spy satellites, 12–14
bus, 6	Mir, 19
Columbia space shuttle, 20, 21	Moon, 4, 16, 18
communication satellites, 11, 14	NASA, 9, 17, 18, 21
downlinking, 7	orbit(s), 4, 5, 8–11, 15, 17–20
Earth Observational satellites, 12	orbiting, 13, 19
Earth Station, 7	payload, 6
elliptical orbit, 10, 18	Polar Orbit, 10
environmental satellites, 12	research, 19, 20, 22
Explorer I, 18	sensors, 7, 17
Global Positioning System, 16	solar energy, 6
gravity, 8, 18, 20	Sputnik I and II, 18
Hubble Space Telescope, 17, 20	Strategic Defense Initiative (SDI/STAR WARS), 13
International Space Station, 19, 20	uplinking, 7
Low Earth Orbit, 8–10, 17, 20, 21	weather, 8, 15, 21
meteorologists, 15	weather satellite, 15

Name _____

INSTRUCTIONS: Use the book, *Satellites*, to find the missing events. Write these events on the timeline.

1687	_____
Oct. 4, 1957	_____
Nov. 3, 1957	_____
Jan. 31, 1958	_____
1958	<i>NASA was formed.</i>
Sept. 13, 1959	<i>USSR's LUNA 2 was the first man-made object to land on the Moon.</i>
1962	_____
1981	_____
1983	_____
1984	_____
Feb. 20, 1986	<i>Russia sent the first part of Mir into space.</i>
March 1, 1986	<i>Japan's Sakigake encountered Halley's Comet.</i>
1990	_____
April 25, 1990	<i>USA and Europe's Hubble Space Telescope launched.</i>
2000	_____
2008	_____

*(To find out when the ISS will fly over your location, visit: <http://spaceflight.nasa.gov/realdata/sightings/index.html>)

Name _____

INSTRUCTIONS: Fill in each blank with the correct article (*a, an, or the*).

Satellite Spotting

Satellites have proven to be useful inventions, making all of our lives a bit easier in today's fast-paced world. Here's how you can see them from Earth.

What do you need? There are over 10,000 satellites orbiting Earth. Many of them are large enough to be seen with _____ naked eye. With _____ pair of binoculars, _____ person can expect to see hundreds of satellites. _____ ideal conditions for satellite spotting are: _____ dark sky away from city lights and pollution, and little or no moonlight.

How often do satellites pass overhead? _____ shape or size of _____ orbit determines the time _____ satellite takes to complete one orbit. This is known as _____ orbital period and can be as brief as 88 minutes. Most satellites will have _____ orbital period of more than _____ hour—about 100 minutes.

Where should you look? _____ majority of satellites are in polar orbits, so they appear to be traveling from north to south or from south to north.

What should you expect to see? _____ satellite must be illuminated by _____ sun and be seen in _____ dark night sky. When you are outside, scan _____ sky with your naked eye. Keep your eyes out for one or more stars that look as if they're moving. Satellites appear whitish in color with perhaps _____ shade of yellow or orange, especially at low elevations.

* (To find out when satellites will fly over your location, visit:
<http://spaceflight.nasa.gov/realdata/sightings/index.html>)

Name _____

INSTRUCTIONS: Look up each content vocabulary word in the dictionary. Fill in the information as indicated.

Entry word	Guide words	Syllables and accent mark	Part of speech	Definition as used in the text
astronomical				
infrared				
stationary				
high-tech				
monitor				
galaxies				
robots				
black holes				
mobile				
eavesdrop				
observational				
evolution				
light rays				
innovative				

Historic Peacemakers

A Reading A-Z Level Z Leveled Reader

Word Count: 2,151

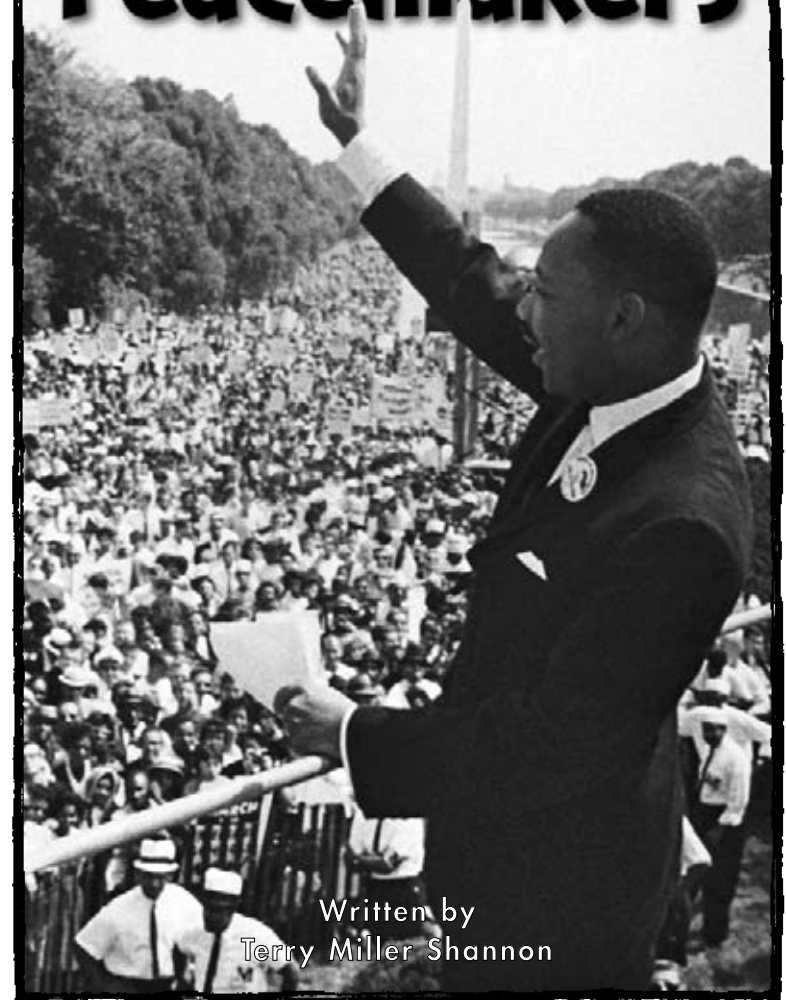



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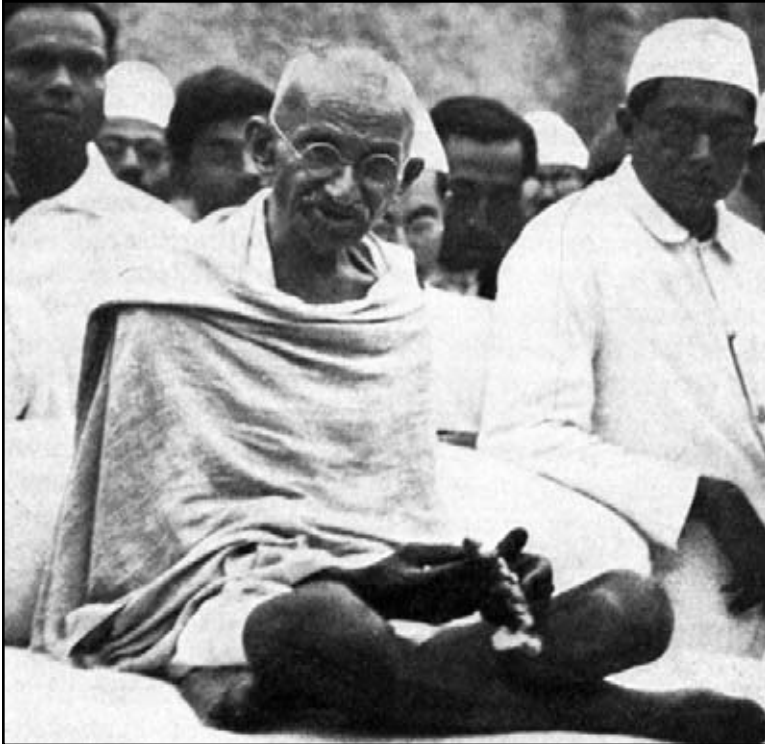
Historic Peacemakers



Written by
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Correlation

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Fountas & Pinnell	V
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Table of Contents

Introduction	4
Mahatma Gandhi	5
Nelson Mandela	8
Martin Luther King, Jr.	11
Mother Teresa	14
Mairead Corrigan and Betty Williams	16
The Peacemaker in You	19
<i>Peer Mediation: How to Start Your Own</i>	
<i>Peacemaking Program at School</i>	20
<i>How Peer Mediation Works</i>	20
<i>How to Set Up a Peer Mediation Program</i>	22
Glossary	23
Explore More	24
Index	24

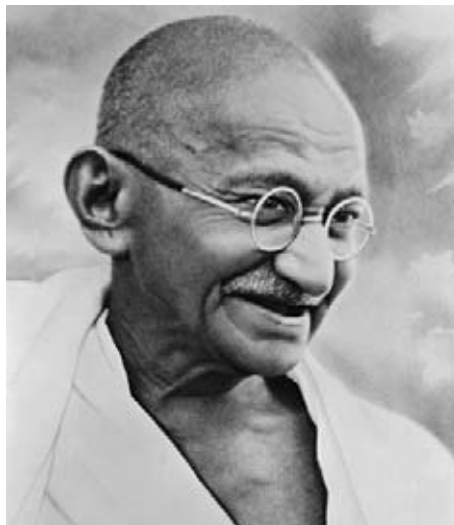
Introduction

Many people work to make the world more peaceful, some in big ways and others in small ways. A peacemaker is someone who works to end wars, conflicts, and disagreements between people, groups, or countries. There are many awards for peacemakers, but the most well-known is the Nobel Peace Prize. In this book, you'll learn about some of the men and women who have worked for peace, many of whom were awarded the Nobel Prize.



The Nobel Peace Prize, an annual international award, has been given since 1901. The Prize includes a monetary award of \$1.3 million that is shared equally among the winners, a gold medal, and a diploma.

© The Nobel Foundation



Mahatma Gandhi

Mahatma Gandhi

Mahatma Gandhi (mah-HAT-mah GAHN-dee) was born October 2, 1869, in Porbandar, Gujarat, India. His name was actually Mohandas Karamchand Gandhi, but he is known by the title *Mahatma*,

which means “great soul.” He went to college in London, England, to become a lawyer. After graduation, he went to South Africa, where he worked to help the laborers from India who lived there. He lived his life with two goals: to set India free from England’s rule, and to free Indians everywhere from **prejudice**.

Gandhi believed in achieving his goals without using force or violence. He felt the best way to fight a bad law was to disobey it. Gandhi also believed in being a good role model for people to follow.

Do You Know?

Gandhi wanted people to use cloth woven in India rather than cloth imported from England. So he spun yarn every day on a spinning wheel.



Gandhi and other Indians march to the sea in protest over England’s tax on Indian salt.

Gandhi is famous for leading his country’s people in nonviolent resistance against England’s rule of India. When England taxed Indian salt in 1930, Gandhi walked more than 100 miles (160 km) to the sea to gather his own salt. He marched for 24 days, and millions of Indians marched with him. When Gandhi reached the sea, he was arrested.

Gandhi spent years of his life in jail. Whenever he heard his followers were acting violently, he stopped eating. The hunger strikes worked. Not only did his followers stop using violence, but England also made **concessions** because they knew how important Gandhi was to the people of India. In 1947, England granted freedom to India.

In India, there was a **caste** system in which the lowest caste, the “untouchables,” did jobs that other castes thought were unclean or dirty. Gandhi was against the caste system and invited untouchables to live with him. Also, two religious groups in India—Hindus and Muslims—fought each other. Gandhi was 78 years old and frail, but he traveled across the country to convince Indians to love each other. Instead, India split into two countries—India, mostly Hindu, and Pakistan, mostly Muslim.

In 1948, Gandhi went to India’s capital to meet with Hindu leaders. However, before the meeting, a Hindu man shot and killed Gandhi on January 30, saying he was too kind to Muslims.

Gandhi was nominated for the Nobel Peace Prize five times, but it was never awarded to him. His principles, based on truth and nonviolence,



have since inspired many more peacemakers.

Gandhi and his granddaughters

Nelson Mandela



Nelson Mandela

Nelson Mandela was born July 18, 1918, in Mvezo, South Africa.

At birth, he was named Rolihlahla Dalibhunga Mandela. He changed his name to Nelson when he was in school. He studied law and became active in politics.

Beginning in the late 1940s, South Africa operated under

a system called **apartheid** (ah-PAR-tide), which separated races. Nonwhites could have only limited contact with white people, and they had no political power. Native black people made up 75 percent of South Africa’s population, yet had poor schooling (or none), poor housing, and most could work only as servants or laborers.

Because Mandela worked with a black political organization to fight apartheid, he was charged with treason. He was found not guilty of the charge and continued to work with the organization even though the government banned it. He was arrested again and put in prison.

Other countries pressured South Africa to give up apartheid. Locally, black and white people led protests against the system. The president of South Africa, a white man named F.W. de Klerk, took steps to end apartheid. He also freed Nelson Mandela, who had been in prison for more than 25 years for fighting for political rights for blacks.



Mandela, with wife Winnie in 1990, when he was released from prison.



Mandela worked with de Klerk to change South Africa's government. In 1994, thanks to the two men, elections were held in South Africa. For the first time, the elections were open to all of South Africa's citizens, no matter what their race. In 1993, the Nobel Peace Prize was awarded to both Mandela and de Klerk for their work on opening elections to all South Africans.

In April 1994, South Africa elected Nelson Mandela as the country's first black president. He knew he was now in the position to lead his country to complete equality between races. He led the government to write a new constitution, which became law in December 1996.

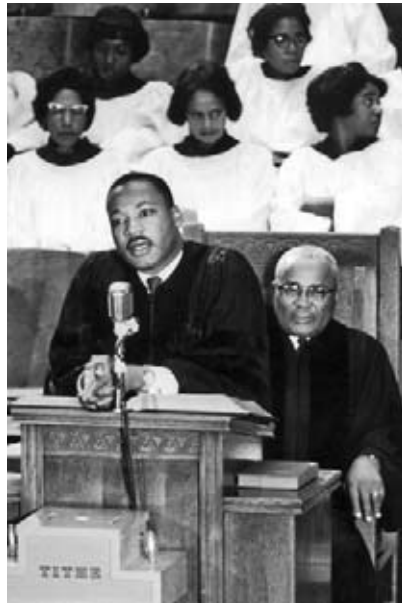
Mandela is known for working with all races in South Africa. His advisors included people of all races. He impressed and made friends with many South African whites who once opposed giving nonwhites political power.

Martin Luther King, Jr.

Martin Luther King, Jr., was born January 15, 1929, in Atlanta, Georgia. He went to school to become a minister, in part because he believed leaders of black churches should take charge of the movement against **discrimination**.

In those days, southern U.S. cities were **segregated**, which meant African-Americans lived separate from whites and were treated as if they were inferior.

As a student, King heard a lecture about Mahatma Gandhi that years later motivated him to lead his own nonviolent struggle against segregation. King asked his Montgomery, Alabama, **congregation** to join him in actively opposing discrimination by joining a civil rights group called the National Association for the Advancement of Colored People (NAACP), and by voting.



King speaks to his Montgomery congregation.



Rosa Parks on the bus after the boycott

In 1955, a black woman named Rosa Parks was arrested when she wouldn't give up her seat on a Montgomery bus to a white man.

In support of her actions, King led a movement to

boycott, or refuse to use, the city's bus system. The boycott resulted in a lawsuit filed by the NAACP. This lawsuit led the U.S. Supreme Court to declare Alabama's segregation laws illegal.

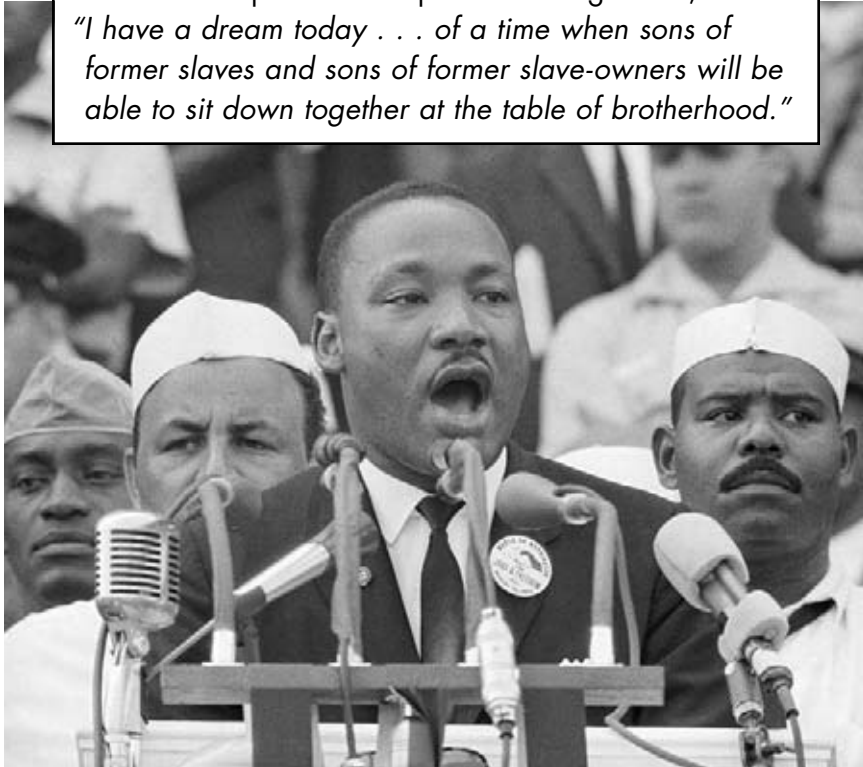
Now King was considered a key U.S. civil rights leader. King's speeches were so impressive that some considered him the leader of the nation's African-American population. He went on to peacefully promote increased African-American voter registration, integrated restaurants, and more. King's goal was for all African-Americans to be active as U.S. citizens.

People sometimes acted violently toward King. He was arrested and his life was threatened, but King never gave up. In July 1964, President Lyndon Johnson signed the Civil Rights Act. Segregation became a federal crime.

Do You Know?

Many people remember Martin Luther King, Jr., for these words spoken at a speech on August 28, 1963:

"I have a dream today . . . of a time when sons of former slaves and sons of former slave-owners will be able to sit down together at the table of brotherhood."



King gives his "I have a dream..." speech.

King won the 1964 Nobel Peace Prize, which celebrated his nonviolent resistance to segregation. On April 4, 1968, in Memphis, Tennessee, a white man shot and killed King. In 1983, as tribute to the civil rights leader, the U.S. Congress declared the third Monday in January as Martin Luther King Jr. Day.



Mother Teresa

Mother Teresa

In 1910, Agnes Gonxha Bojaxhiu (gon-KHA bo-yakh-YOO) was born in the country that later became Yugoslavia and is now part of Macedonia. She changed her name to Teresa when she became a Catholic nun.

In 1928, Mother Teresa went to teach at a high school in Calcutta, India. After 18 years of teaching, she believed it was her purpose in life to leave the school and help those living in poverty.

Mother Teresa began wearing a white sari similar to the dress worn by India's poor women. She took a nursing course, and then opened a school in Calcutta's slums. In 1950 she started a new order for missionaries. More than 24 women joined the order within five years. Mother Teresa opened a home for the dying poor of Calcutta; an orphanage; a home for people infected with **leprosy**; a home for the aging; a learning center to teach skills to the jobless; medical clinics; and shelters for homeless women and children.

In the 1960s, Mother Teresa's Missionaries of Charity opened similar shelters for the poor in other countries. India's government and the Roman Catholic Church honored Mother Teresa for her work. In 1979, Mother Teresa won the Nobel Peace Prize for her care of the poor. She used her prize money to build more aid centers.

Mother Teresa died as a result of a heart attack on September 5, 1997, in Calcutta, India.



Mother Teresa at orphanage

Mairead Corrigan and Betty Williams

Mairead Corrigan was born January 27, 1944, in Belfast, Northern Ireland. Betty Williams was born May 22, 1943, also in Belfast. They lived during a time when Catholic Irish Republican Army members were killing and terrorizing people, trying to drive the British out of Northern Ireland. Groups of Protestants responded in kind. Hundreds on both sides were killed and thousands were injured. Property damage from the civil war reached millions of dollars.



Mairead Corrigan

Williams met Corrigan in August 1976 after an accident in which a car driven by a member of the IRA swerved out of control, hitting a family, killing three children, and injuring their mother.

Betty Williams witnessed the accident. She vowed to do what she could to restore peace and began a petition calling for an end to the fighting. Corrigan was the sister of the injured woman and aunt to the children who were killed. She criticized the IRA's violence on television the day after the accident.

Two nights later, Corrigan saw Williams discussing her petition on television and called to invite her to the funeral. Corrigan and Williams led a protest demonstration of about 10,000 women to the graves of the victims.



Betty Williams

The two women became friends, joined together by the horror they felt over the violence in their country. They decided to create an organization to promote peace in Ireland. They joined with a popular journalist and founded Peace

People. The group wrote and distributed a booklet called *The Price of Peace*. They organized marches in the name of peace, in which thousands of people participated.

Corrigan and Williams traveled to countries throughout the world on behalf of peace for Ireland. Although their lives were threatened, they were steadfast in their goal for peace. By the end of the summer of 1977, violent acts related to the Irish conflict were reduced by more than half.

Williams and Corrigan won the 1976 Nobel Peace Prize. The two women continued to work with Peace People by helping survivors of attacks and victims of violence. They built community centers in poverty-stricken areas and helped to rebuild damaged buildings. They raised millions of dollars to support their programs, including one in which they persuaded terrorists to turn in their weapons. Other awards acknowledging their peacemaking efforts were given to Corrigan and Williams. The two women continue to work for peace.



Betty Williams and Mairead Corrigan march for peace.



Friends who learn to talk about their problems learn to keep the peace.

The Peacemaker In You

Peacemakers help make the world a better place to live, and so can you. Many people who lead ordinary lives devote time and energy to work against war and injustice. By working to solve arguments within your family, between friends, at school, and in your community, you can become a peacemaker and make a difference, too. You may inspire others to act as peacemakers. Remember, each effort—big or small—makes the world a more peaceful place to live.

Peer Mediation: How to Start Your Own Peacemaking Program at School

When there are conflicts between students, it often leads to violent feelings and sometimes to violent actions. Some schools have formed peer **mediation** programs. Trained students guide arguing students to work out their differences. Two benefits of this program are: people learn that respectful discussion solves conflicts, and the students themselves solve the problems.

How Peer Mediation Works

It begins when two or more students have an argument. The teacher gives them the option of going to a peer mediator, or going to the school principal. It's always the students' choice. A trained student guides those who choose mediation through a discussion in which they learn to negotiate with each other.



Also, peer mediators can step in if they happen to see two students arguing on the playground.

It might happen like this:

- Mediator introduces him or herself and asks if the arguing students want to solve the problem. If the answer is yes, they all go to an area set aside for solving problems.
- Students must agree to solve the problem without calling each other names or interrupting.
- Students must agree to tell the truth.
- Mediator asks each person what happened and how each felt about it.
- Mediator asks both students for solutions to the problem.
- Mediator works with the students to find a solution they both like.
- Mediator congratulates the students!



How to Set Up a Peer Mediation Program

Schoolteachers must support a peer mediation program, so your first step is to find a teacher who will sponsor your group. Usually, all the teachers will vote on whether or not the school should start a mediation program. Next, teachers go through mediation training, which is usually taught by a community mediation center. Then a small group of volunteer student mediators is chosen or nominated. Most middle school peer mediators attend 12 to 15 hours

Positive Results

How well do peer mediation programs work? Some schools have reported significant decreases in suspensions for fighting. In one survey, more than 8 out of 10 middle schools called their peer mediation programs successful.

of training. Classes teach the definition of conflict, how to communicate and listen, and how to act as an effective go-between.



Glossary

apartheid	keeping different races separate from each other (p. 8)
boycott	refusing to take part in something in order to make a point (p. 12)
caste	social position based on birth and job (p. 7)
concessions	allowing something that ordinarily would not be allowed (p. 6)
congregation	a group of people gathered together for church (p. 11)
discrimination	treating people unfairly (p. 11)
leprosy	a disease affecting skin, nerves, and muscles (p. 15)
mediation	settling differences between people or groups of people (p. 20)
prejudice	a fixed and unfair opinion about someone because of their race (p. 5)
sari	a long piece of cloth wrapped around the body with one end forming an ankle-length skirt and the other end draped across the chest, over one shoulder (p. 15)
segregated	groups of people kept apart (p. 11)

Explore More

On the Internet use *www.google.com* to find out more about topics presented in this book. Use terms from the text, or try searching for glossary or index words.

Some searches to try: *Gandhi, Nobel Peace Prize, or peer mediation programs.*

Index

apartheid, 8, 9	Nobel Peace Prize, 4, 7, 13, 15, 18
civil rights, 11-13	nonviolent (nonviolence), 6, 7, 11, 13
Corrigan, Mairead, 16-18	Northern Ireland, 16
deaths, 7, 13, 15, 16	Peace People, 17
de Klerk, F.W., 9, 10	peer mediation, 20-22
discrimination, 11	poverty, 14, 18
England, 5, 6	prison (jail), 6, 9
Gandhi, Mahatma, 5-7, 11	race(s), 8, 10
hunger strikes, 6	segregation, 11-13
India, 5-7, 14, 15	South Africa, 5, 8-10
Irish Republican Army, 16	Teresa, Mother, 14, 15
King, Martin Luther, Jr., 11-13	untouchables, 7
Macedonia (Yugoslavia), 14	violence, 6, 16-18
Mandela, Nelson, 8-10	Williams, Betty, 16-18
National Association for the Advancement of Colored People, 11, 12	

Name _____

INSTRUCTIONS: In the first row, write what you already know about *Historic Peacemakers*. In the second row, write what you would like to learn. After you finish reading, fill in the third row with what you learned from the book.

What I Know

What I Want to Know

What I Learned

Name _____

INSTRUCTIONS: The list below gives examples of different types of writing. On the blank lines, write whether the author's main purpose is to inform, entertain, or persuade.

1. _____ science book
2. _____ comic book
3. _____ detergent advertisement
4. _____ mystery book
5. _____ "Say No To Drugs" poster
6. _____ social studies book
7. _____ folktale book
8. _____ cereal advertisement
9. _____ encyclopedia
10. _____ newspaper comic strip

Name _____

INSTRUCTIONS: Write a vocabulary word from *Historic Peacemakers* in the word box. Below it, write the definition of the word. Write a synonym and an antonym on either side of the word. Then use the word in a sentence of your own.

Synonym	Word Box	Antonym

Definition

Sentence

Synonym	Word Box	Antonym

Definition

Sentence

Acropolis Adventure

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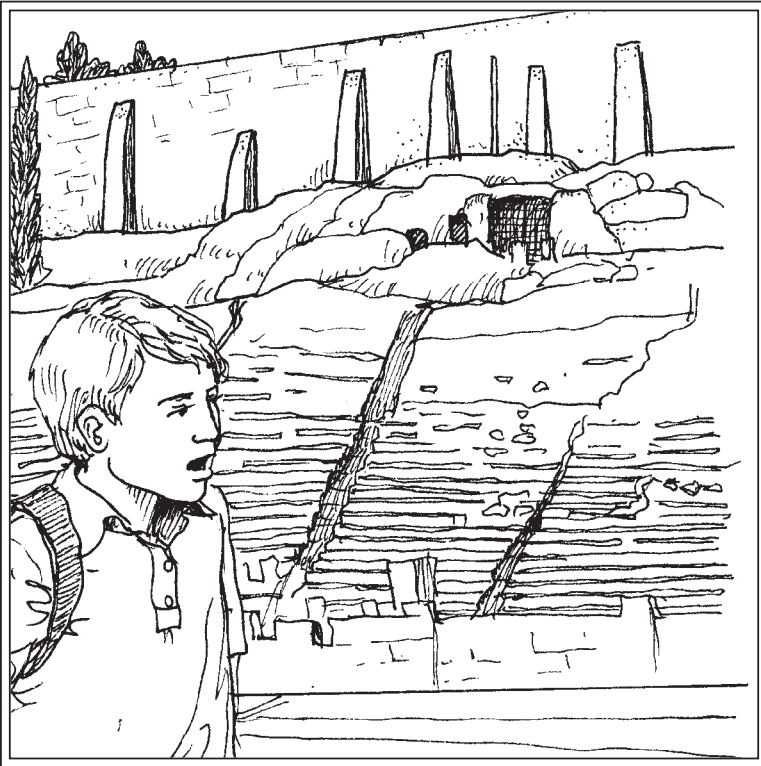
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DRA	50

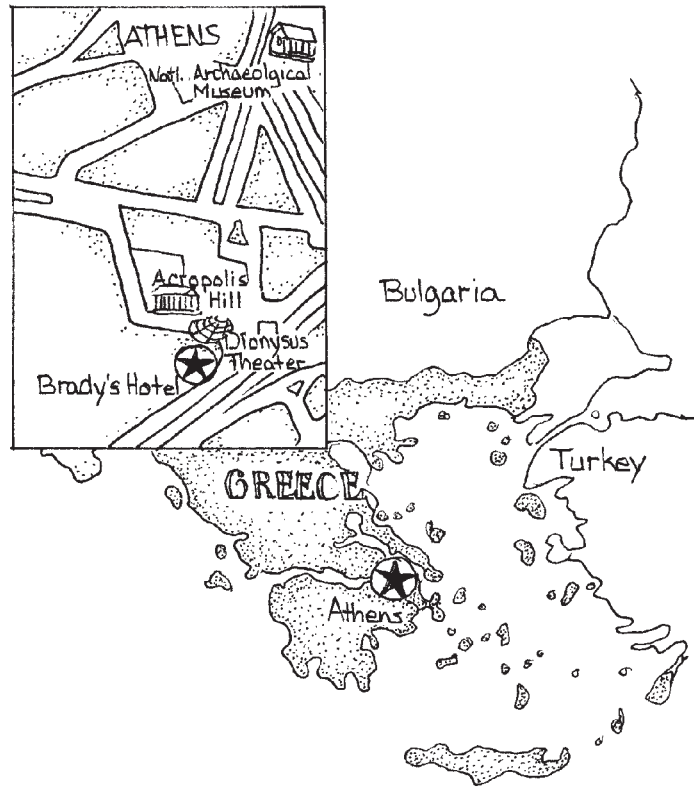


TABLE OF CONTENTS

Dimitri the Greek	4
Winding Around the Acropolis.....	8
Discovering the Theater	13
Climbing to the Top	17
Glossary	24

DIMITRI THE GREEK

"You must be Brady."

Surprised, Brady stopped and looked around; he felt jostled by large crowds of tourists streaming down narrow stone-paved streets like rivers of people.

"Over here, young man," the voice continued.

Brady squinted in the bright morning sunshine, struggling to find the voice's origin. He glanced toward a shady sidewalk cafe on the busy street, but the glaring sunlight kept Brady's eyes from penetrating deep into shadows created by umbrellas.

"Yes," Brady answered timidly.

"You're Brady, son of my American friend, John Phillips?" the voice questioned.

"Yeah," Brady answered more surely.

"Please, my young friend, come and sit with me."

As Brady slowly moved into the shade, his eyes adjusted. He noticed this tall figure sitting alone at a table in the corner. The man's head looked completely bald and tanned by years



in the sun, yet his eyes beamed bright and welcoming. Even though the man was sitting down, Brady could tell he was tall and slender because his clothes hung loosely.

“Are you Dimitri?” Brady inquired, rather cautiously.

Brady was on vacation with his parents in Greece, and they’d arranged for him to connect with Dimitri, an old family friend, while they spent precious time visiting the **Athens** National Museum. Brady wasn’t thrilled to hang out with Dimitri, but his father assured him that it’d be a day he’d never forget, so Brady begrudgingly obliged.

“Yes, I am,” the man answered. “Actually, it’s Dimitrious Thanapopoulous, at your service,” he continued with a slight bow of his head, “but please call me Dimitri.”

“So, you know my dad?” Brady wondered.

“Yes, Brady. I met your father when he graduated college and felt eager to experience life outside the United States. We explored the **European** countries of Greece, Italy, France, and Spain together, and I owe your father a debt for saving my life.”

Dimitri stopped speaking and closed his eyes. A tiny smile crossed his face, and the wrinkles around his eyes deepened. “What a glorious time; remember, all of us older folks were once young and full of questions and energy like you,” Dimitri observed.

“Well, I don’t have many questions,” Brady answered with a shrug of his shoulders. “All this **ancient** history and learning about other countries seems boring.”

“Boring?” Dimitri boomed. “My friend, you’re in one of the most exciting cities; Athens is the birthplace of many ideas that are the foundation of our modern world.”

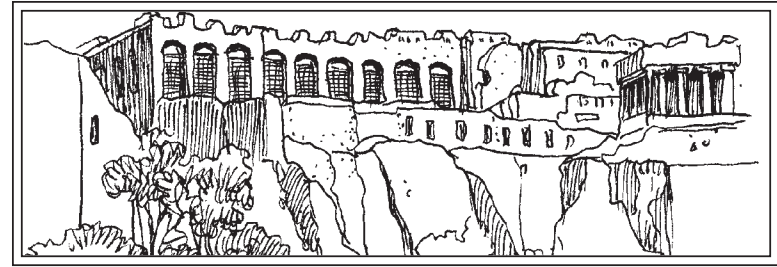
"Yeah, yeah, I've heard," Brady said, "but in my world, in my little sixth-grade reality, a bunch of dates and names don't mean anything to me."

"Well, that's about to change," Dimitri exclaimed, patting Brady on the shoulder. "I'm going to bring the secrets of Athens to life before your very eyes."

"I'm more interested in how my father saved your life. He didn't mention anything about that. As far as visiting places in Greece, I don't have much money," Brady responded, hoping this would excuse him from a day of historical sightseeing.

"Money isn't needed," Dimitri answered, "Simply open your imagination and I'll do the rest. What do you say?" Dimitri asked, extending a suntanned arm toward Brady for a handshake. "And for a treat, at the end, I'll tell you a story about your dad."

"Well, okay, I guess," Brady replied.



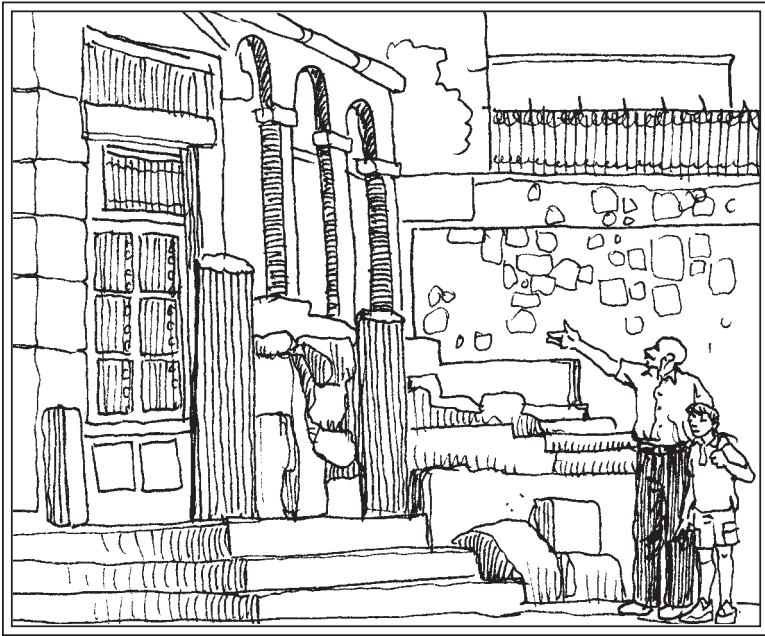
WINDING AROUND THE ACROPOLIS

Dimitri and Brady left the cafe, working their way among groups of tourists sightseeing and shopping along the narrow streets of Old Athens, that wound through the city like a snake. The pair walked toward the steep-sided hill called the Acropolis, which was Greece's most famous **landmark**. The Acropolis hill rose up and towered above the crowded streets of the city. Brady previously saw the buildings on the hilltop lit up at night, glowing high above the city as if anchored in the ground like a huge cruise ship.

Before Dimitri and Brady reached the foot of the steep slope leading up to the hilltop, Dimitri steered Brady away from the crowd.

Off the street, through a rusty, iron gate stretched a flat, dusty plot of land dotted with several marble columns and bits of old stone-paved roads. A modern iron fence separated this area from the rest of Athens like a private park or cemetery.

“What are we doing here?” Brady protested. Instead of answering, Dimitri led Brady toward a stone tower near a fenced area. The tower resembled a two-story-high marble **octagon** that had turned gray and rough with weather and age. Atop each of the eight flat sides, a carved figure appeared as if floating on the wind.



“Brady, tell me what you see,” Dimitri demanded quietly.

“Um, a tower,” Brady answered.

“That’s obvious,” Dimitri smiled, “look closer and tell me what you really see.”

Brady shaded his eyes with his hand and focused. He noticed several small metal rods—rusted with age—poking out from flat sides of the tower at odd angles. Each rod rose out from one of the floating figures. “What are those rods for?” Brady asked.

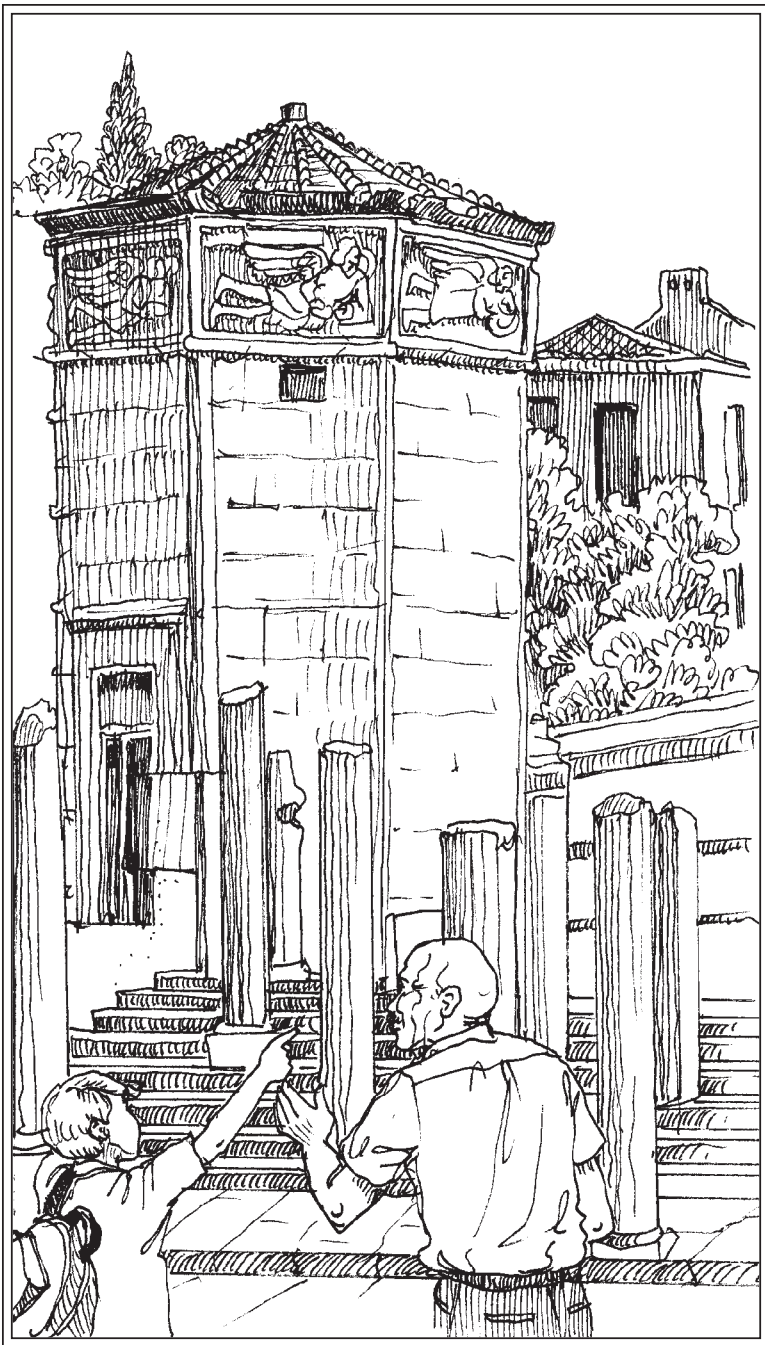
“Ah, so now you notice something unusual,” Dimitri answered. “We miss so much in life if we fail to notice the details—if we don’t *really* keep our eyes open.”

“My dad says that, too,” Brady answered, “but what are these metal things for?”

“Well, my suddenly inquisitive friend, this is the Tower of the Winds, built approximately 100 BC by an astronomer named **Andronicus** (an-draw-NAI-kuhs).” As Dimitri spoke, he leaned back and focused his attention on the tower. “Brady, look more closely at the carvings and tell me if you see the straight lines cutting through the figures?”

“Yes,” Brady answered, noticing lines stretching out like spokes on a wheel.

“Do you know what a sundial is?” Dimitri asked, keeping his eyes on the tower.



"Yeah," Brady answered, "It tells time by the shadow created by the Sun, right?"

"Exactly," Dimitri responded. "Imagine this tower as one giant sundial, but a sundial also working all year long as a calendar."

"I don't understand," Brady said, looking more closely at the markings.

"It's quite brilliant, really," Dimitri continued. "The Sun changes position in the sky throughout the year. Each of the lines, when hit by the shadow cast by the rod, told the citizens of Athens the exact time of day, but also the exact time of year."

Dimitri stepped back and spread his arms wide in the direction of the tower: "A giant marble calendar!"

"Man, that's really cool," Brady answered enthusiastically.

"Cool?" Dimitri asked. "What exactly do you mean by 'cool'? Be more specific."



“Okay,” Brady replied, staring hard at the tower. “I mean . . . it’s surprising that this Andronicus guy who lived so long ago figured out exactly how to measure time.”

“Much better,” Dimitri smiled. “And speaking of time, we’d better quicken our pace if we’re going to meet your splendid parents for dinner tonight. We have much yet to see.”

“Dimitri, will you now tell me how my father saved your life?”

“Not yet, young man,” said Dimitri, “remember, patience is an important virtue.”

DISCOVERING THE THEATER

Dimitri and Brady soon rejoined the walking crowds filling the narrow stone streets at the Acropolis’s base. Brady lagged behind, unable to keep up with Dimitri’s determined pace. Brady began to notice local people working in the restaurants surrounding the Acropolis, along with tourists from all over the world with cameras around their necks and maps in hand. Suddenly, Brady gasped, “Whoa! What’s that?”

“Brady, such emotion from you? I’m surprised,” Dimitri grinned.

“Oh, I just meant it took me by surprise, that’s all—no big deal,” Brady answered, slightly embarrassed. “But what is this place?” he continued.



Stretching up the slope toward the Acropolis, looming before Dimitri and Brady, stood row after row of stone benches in a gigantic semicircle. The benches brightly reflected the midday sun.

After giving Brady some time, Dimitri spoke: “So, Brady, do you like movies?”

“Of course,” Brady said, puzzled, but not taking his eyes off the sight before him.

“Well, they started right here,” Dimitri stated, “All our ideas of drama, **comedy**, and **tragedy** began with **Greek** theater. Twenty-four centuries ago, great plays were performed in this ancient arena, the Theater of Dionysus (dy-uh-NY-suhs),” Dimitri continued. “Once a year, 17,000 people watched play after play—tragedies and comedies—many we still perform and study. At the end of a three-day contest, citizens decided on the winning play.”

Brady tried to picture the slightly overgrown stone theater filled with people. The actors must have struggled to have their lines heard by those seated in the very top rows.

“Dimitri,” Brady asked, “did the Greeks have microphones?”

“Brady, it was 400 BC,” Dimitri said, laughing, “There were no microphones.”

“Then how could people watching from the top rows hear actors onstage?”

Instead of answering, Dimitri instructed Brady to climb to the last row of seats. As Brady scrambled up the steep marble steps worn smooth by centuries of footsteps, his leg muscles burned like wood over hot coals. He began sweating profusely.

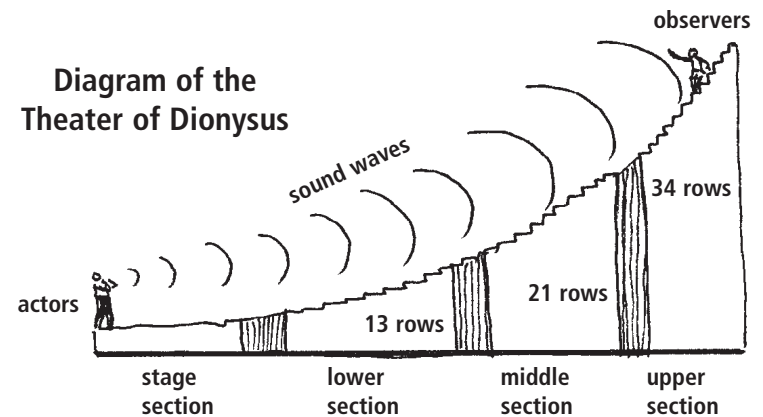
Brady finally reached the top row, winded from the climb. He turned toward the stage where Dimitri, tiny from this distance, stood in the middle, waving his lanky arms. Then the kind guide cupped his hand around his ear, giving Brady the silent signal to listen.

Brady felt completely shocked to hear Dimitri’s voice come to him in a normal, everyday tone. It sounded as though Dimitri were standing right next to him, Brady thought.

“So, Brady,” Dimitri said from below, “can you hear how they didn’t need microphones back then?”

“Yes!” Brady yelled excitedly, his voice echoing off nearby cliffs and stone. “This is amazing!”

“Well, come down and I’ll explain how,” Dimitri added.



After climbing back down, Brady listened, amazed by the simplicity of the Greeks' plan for outdoor theaters. Based on mathematics, Dimitri explained, the theater was divided into three equal sections—lower, middle, and upper. Each section of the semicircle tilted at a slightly higher angle than the level below it. This created a bowl effect, trapping sounds from the stage. As long as each row of seats was placed in exact **proportion** to the stage, the audience members could hear the actors.

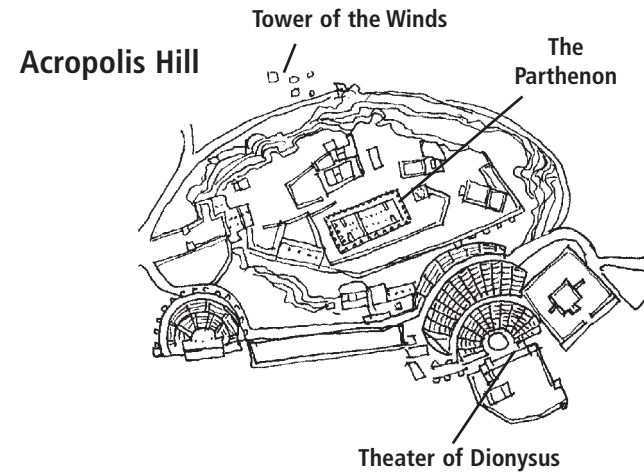
As Dimitri and Brady turned to leave the theater, Brady shook his head, "I can't believe things like this could've been built so long ago; perhaps, I've misjudged history." Brady now loved his adventure, and no longer regretted sightseeing with Dimitri.

"We still have the Acropolis to visit," Dimitri said excitedly as they left the theater.

CLIMBING TO THE TOP

Continuing along the stone walkway following the curve of the hillside, they noticed people above them, gathered around the entrance gate to the Acropolis like a flock of pigeons eating breadcrumbs. From where Dimitri and Brady stood, all Brady could see were the modern

buildings and pathways of a city park surrounding the entrance and a series of broken-down marble buildings higher up on the hillside.



"Dimitri, I don't understand the big deal," Brady muttered, looking at the crowds of people swarming over steps leading up the hill. "We've walked so far to experience the Acropolis, yet all this place looks like is a bunch of broken, scattered rocks."

"Brady, my impatient friend, it's a matter of **perspective**," Dimitri maintained.

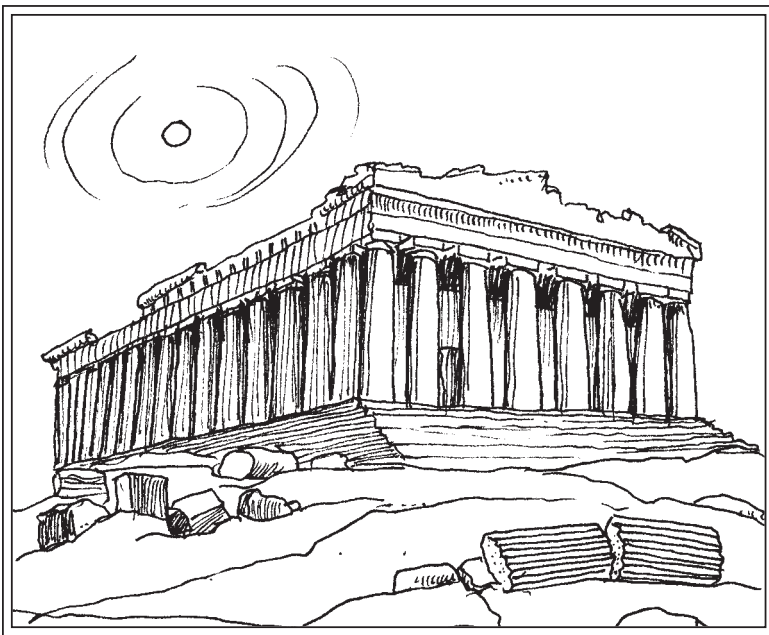
"Perspective?" Brady wondered.

"Yes," Dimitri responded, "what you see from where you're standing—this represents perspective. What's important to realize is that you often can't

see everything from your own viewpoint. It's an important lesson to learn." Dimitri paused for a moment, letting Brady think about what he'd said. Then he continued. "Don't you think there's a legitimate reason these people walked so far and climbed such a **multitude** of steps?"

"Yeah, I guess," Brady admitted.

"Then you need to look past what your eyes tell you; ask your father, he knows. As far as the Acropolis is concerned, trust me, beyond the top of those marble steps lies one of the wonders of the ancient world—the Parthenon and many buildings of the Acropolis."



Sure enough, after reaching the top, Brady's jaw dropped open at the sight before him. On the highest point of the Acropolis hill stood a stone temple with evenly spaced, massive columns of marble—the Parthenon. It looked as big as a modern football stadium but was decorated with carved figures and **geometric** patterns in stone. The entire building seemed to glow a honey-orange color in the late afternoon light. Shafts of sunlight shot down between the columns, reaching toward the earth from the sky.

Brady tried to think of something back home that would compare to this, but nothing came to mind. His thoughts spun as he tried to picture this magnificent temple being built by ancient Greeks centuries before people even knew the Earth was round.

"So, worth the climb?" Dimitri queried playfully.

"Yes, it's awesome," Brady answered.

Dimitri and Brady walked around the Parthenon admiring the perfect lines in the building and its unbelievable height. At various places near the roof, Brady saw detailed scenes carved into the stone—perfect images of faces, clothing, animals, and ancient gods.

"Dimitri," he asked, after momentarily losing sight of his friend in the crowd around the temple, "this building's so different from other great buildings I've seen. We don't decorate our buildings, not like this. American buildings are all glass and steel."

"That's true," Dimitri agreed, "but you've got to remember, this wasn't an ordinary building. This was a magnificent temple to the goddess Athena, the protector of Athens. All buildings of the Acropolis celebrated the utter greatness of Athens."



"Things sure are different today," Brady answered, marveling at the monument before

him and comparing it in his mind's eye to the churches and office buildings back home.

After admiring the Parthenon and other buildings, Brady found himself against a wall on the extreme edge of the hilltop.

Below him in every direction stretched the crowded streets and rooftops of Athens. In the distance, he could see the large oval of the Olympic stadium, and, even farther away, the glistening sea. As the Sun turned orange and began to drop below the horizon, Brady's thoughts wandered back over all he'd seen.

"You know, Dimitri," Brady said, while focusing on the brilliant sunset spilling out before him, "You're right, I need to pay more attention to the details of life. I would've missed so many of these amazing sights if I were here by myself. Thank you for opening my eyes about these places. Now will you please tell me how my father saved your life?"

"You don't need to thank me, my friend," Dimitri answered, putting a hand on Brady's shoulder and joining him in admiring the sunset. "Nothing in life pleases me more than seeing friends truly appreciate the wonders of life." Dimitri stood silently for an extended moment before continuing:

“Now I’ll explain how your father’s a hero.”

“My father was a hero?” asked Brady, shocked.

“Your father and I were traveling in Spain when we decided to take part in the Running of the Bulls, a Spanish tradition in which regular people carouse with hundreds of wild bulls. What an exciting time! But while running, I took my eyes off the bulls and would have been stampeded to death except that your father pushed me out of the way at the last instant. That’s why I said it’s important to see things from a certain viewpoint, and that’s also why your father and I say it’s important to keep your eyes open.”

“Wow, I never knew my father had that in him,” Brady replied. In the fading light, Brady thought about how he’d leave Greece a different person than when he arrived.



GLOSSARY

ancient (<i>adj.</i>)	from a very long time ago (p. 6)
Andronicus (<i>n.</i>)	an astronomer, engineer, and architect from Syria who lived during the 1st century BC (p. 10)
Athens (<i>n.</i>)	the capital of Greece (p. 5)
comedy (<i>n.</i>)	a type of entertainment with funny characters and a happy ending (p. 15)
European (<i>adj.</i>)	of or relating to the continent of Europe (p. 6)
geometric (<i>adj.</i>)	relating to the field of math that deals with angles, points, lines, surfaces, and solids (p. 20)
Greek (<i>adj.</i>)	of or relating to the country of Greece and its people (p. 15)
landmark (<i>n.</i>)	an object, feature, or site that is easily seen from far away, often important because of its history (p. 8)
multitude (<i>n.</i>)	a large number of items (p. 19)
octagon (<i>n.</i>)	a shape with eight angles and eight sides (p. 9)
perspective (<i>n.</i>)	one’s own viewpoint; also, an understanding of the true relationship and importance of things (p. 18)
proportion (<i>n.</i>)	portions or parts in relation to the whole; a pleasing arrangement of parts (p. 17)
tragedy (<i>n.</i>)	a serious play, movie, or book with a sad ending (p. 15)

Name _____

INSTRUCTIONS: Draw a picture to represent a part in the story where you stopped to visualize to help you understand what you'd just read.



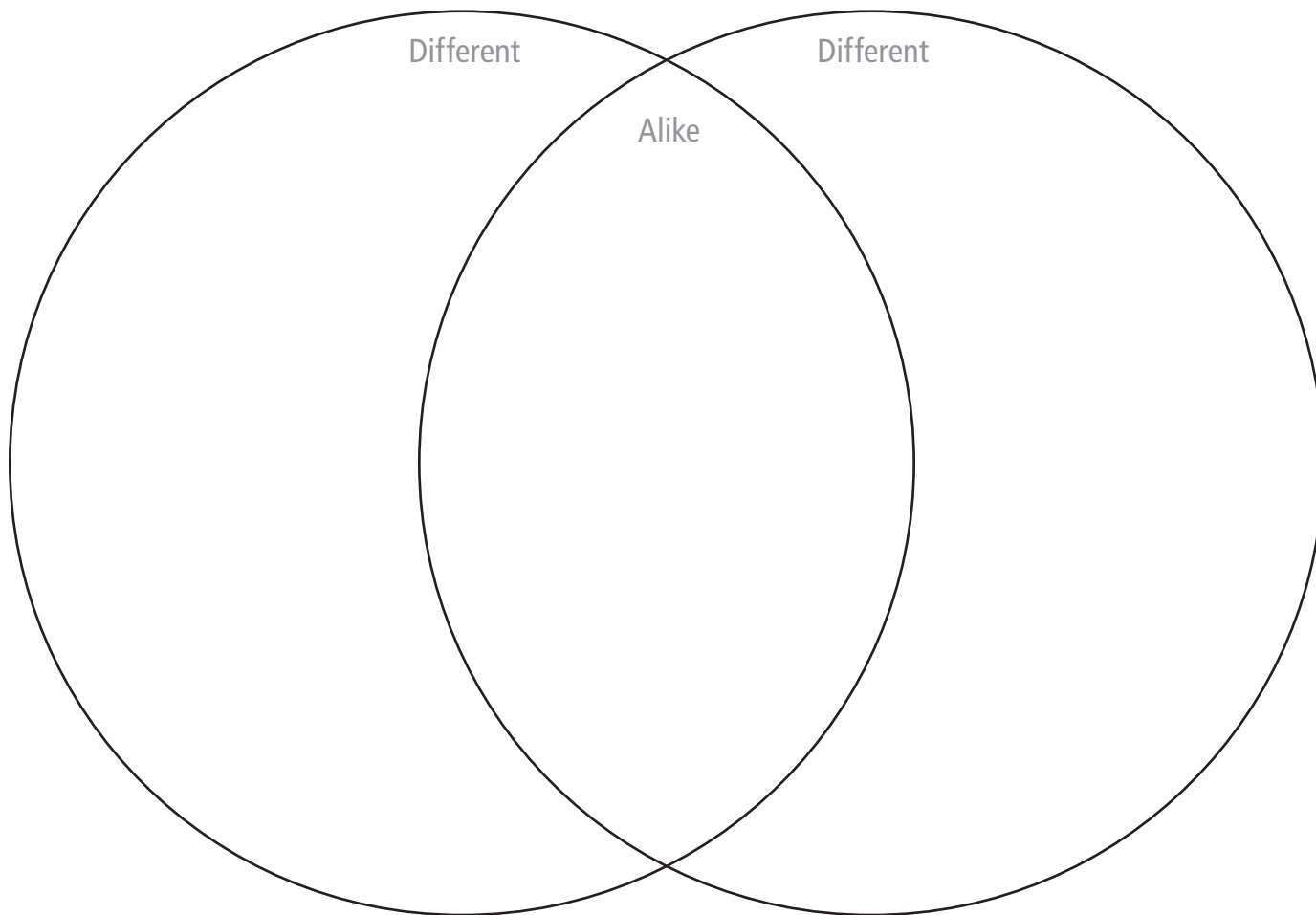
INSTRUCTIONS: Write at least five sentences to explain your drawing and the scene it represents.

Name _____

INSTRUCTIONS: Compare and contrast ancient Greece to present-day Greece. Write the two topics you are comparing on the lines below. Write the details that tell how the topics are different in the outer circles. Write details that tell how the topics are alike where the circles overlap.

Topic: _____

Topic: _____



ALIKE: _____

DIFFERENT: _____

Name _____

INSTRUCTIONS: Use *Acropolis Adventure* to complete the work below. For each example, write (S) for simile or (M) for metaphor to the left of each number to identify each example. Next, find the page on which the simile or metaphor is found in the book, and write the page number inside the parentheses. Finally, on the lines beneath each example, write what the simile or metaphor is being compared to.

_____ 1. like a huge cruise ship (page _____)

_____ 2. like spokes on a wheel (page _____)

_____ 3. like a flock of pigeons (page _____)

_____ 4. a giant marble calendar (page _____)

_____ 5. like rivers (page _____)

_____ 6. as if floating on the wind (page _____)

_____ 7. like a private park or cemetery (page _____)

_____ 8. as one giant sundial (page _____)

_____ 9. like a snake (page _____)

_____ 10. as big as a modern football stadium (page _____)

The Black Stones

A Reading A-Z Level Z Leveled Reader

Word Count: 2,299



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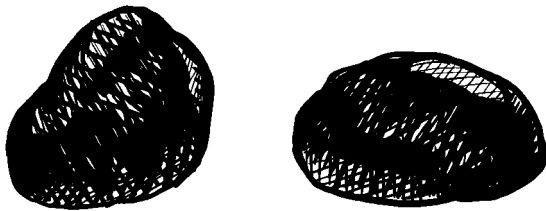
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Fountas & Pinnell	V
Reading Recovery	29
DRA	N/A

Table of Contents

The Stones	4
Volcanoes and Magic	8
The Experiment	12
Searching for Answers	16
Apache Teardrops	20
Glossary	24



The Stones

Tala glanced over her shoulder before she picked up the two small, black stones near the river's edge at the base of Apache Leap Mountain. If her brother was watching, he'd want the stones for himself, and she didn't want to give them to him. She had **discovered** them, and they were hers.

Paco was busy tossing pebbles into the river, so Tala knelt down and picked up the shimmering black stones, which were as dark as the blackest starless night. When she held them up to the sun, the light glittered through them, changing them to a clear, **translucent** color.



"Let me see!" her brother called.

Tala groaned and clutched the stones tightly in her fist. If she was quick enough, she might be able to hide them from her annoying twin.

Tala hugged her knees and listened to her brother's footsteps as he leapt from rock to rock, moving closer and closer.

When he was behind her, she rose and started to walk away.

"Come on!" Paco said. "Show me what's in your hand."

Tala knew that if she revealed the stones, her brother would implore and beseech and beg her to give them to him. She knew that he would keep on begging until she became furious, or gave in.

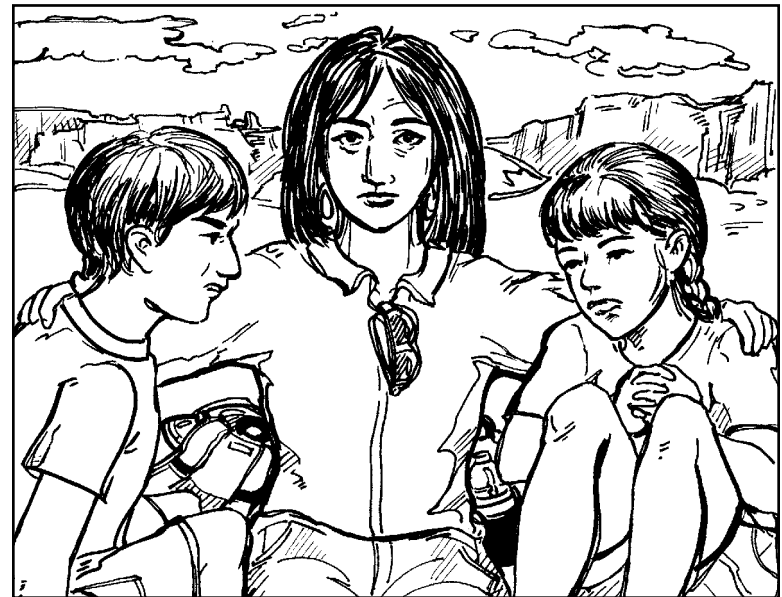
Tala swung around. "These stones are mine!" she shouted. "I found them, and I'm keeping them, no matter what you say!"

"Just show them to me!" Paco shouted back as he grabbed her fist and tried to pry it open.

"MOM!" Tala cried. "MOM! Paco's bothering me again!"

Mrs. Yates sighed and raised herself from the flat rock where she had been sitting for the peaceful last half hour. The twins hadn't been fighting, which was unusual for them, but things were back to normal now. They were at it again. *If only they could learn to get along*, she thought as she made her way down to the riverbank. *If only they could be good friends.*

Mrs. Yates dragged her twins apart and sat them down on either side of her. She decided to let them calm down before she said anything. Maybe this time things would be different; maybe one of them would apologize—but neither Paco nor Tala said a word.





Tala clutched her stones tightly and thought about how the river had **polished** and smoothed them.

"I was the one who found the stones!" she said when she had calmed down a bit. "Paco tried to take them away from me. It's his fault. I didn't do anything."

"Yes, you did!" Paco insisted. "You wouldn't even let me see what they looked like when the sun was shining on them. I saw you holding them up to the light! All I wanted to do was **examine** them."

"They're mine!" Tala shouted.

Mrs. Yates closed her eyes to gather her thoughts—their fighting was making her weary and very, very sad.

Volcanoes and Magic

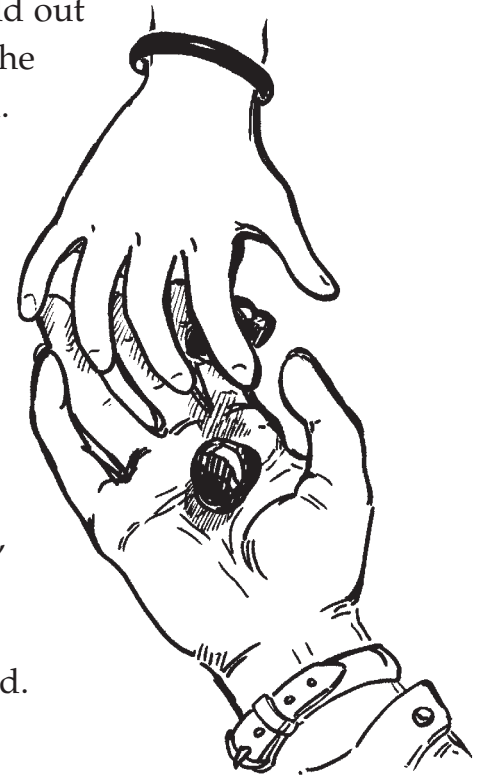
"Your constant arguments make me very unhappy," Mrs. Yates said softly. "You're brother and sister, and even twins. You could be best friends for your whole life if you would only try a little harder to get along. Will you try?"

Tala and Paco stared silently at the river. Mrs. Yates could tell by the way their jaws tightened and their backs tensed that they had no intention of trying to get along now, or ever.

She sighed and held out her hand. "Give me the stones, Tala," she said.

"But it's not fair," Tala whined. "I found them, not Paco. They're mine."

Mrs. Yates waited. Tala's lips were rigid with anger, but she dropped the shiny black stones into her mother's hand.



"It's okay to be angry," her mother said. "Sometimes life doesn't seem fair at all. Everyone feels that way from time to time, but someday you'll learn that sharing makes you feel better than having a full pocket. You've heard the saying, 'It's better to give than to receive,' haven't you? Well, it's true."

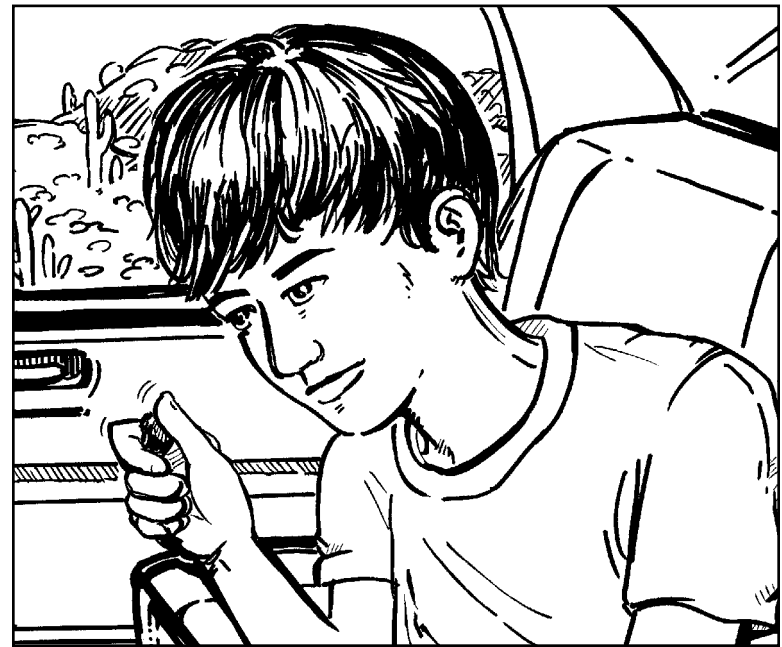
Tala folded her arms and felt her whole body stiffen. She was furious. After all, she'd found the stones, hadn't she? So why was her mother talking about giving and sharing?

A moment later, Mrs. Yates told them both to hold out their hands as she dropped one stone onto each child's outstretched palm. Then she led Tala and Paco up the trail and home for dinner.



Tala and Paco may have been twins, but they were very different. Tala looked at the world as a scientist so everything was a question. She wanted to know why the sky turned orange at sunset and how a seashell created an echo. Paco, on the other hand, saw the world as a magical place filled with poems waiting to be written. Paco marveled at the beauty of an orange sunset and the mystery of a seashell's echo.

Paco wondered if his stone could lead him into magical worlds. Maybe if he rubbed it three times, a genie would appear. Or perhaps it was a good-luck charm that would protect him all his life.



When Tala looked at her glassy stone, questions bubbled up inside her mind. How long had the stone been there? How old was it? Had it been formed by hot lava spewing out of a volcano?

Of course the twins argued about what it was, and what it wasn't, and who was right and who was wrong, and . . .

"STOP IT!" Mrs. Yates shouted when she just couldn't listen to them for one more minute.

"But it's a **volcanic** glass rock!" Tala insisted. "I know it spewed out from inside the earth!"

"You're wrong!" Paco hollered. "It's a magical good-luck stone!"

Mrs. Yates groaned and led the twins to the computer. She sat down between them and turned it on.



The Experiment

As the computer booted up, the twins started to argue about what **website** they would access first, but their mother stopped them.

"May I ask the two of you for a favor?" she said.

The twins waited.

"I would like you to do an **experiment**, as a gift to me. Just this once, I would like you both to **research** your stones without arguing. I'll work with you to find the answers, but no fighting. I want you to understand that life is much more peaceful if you work together to solve your problems. Okay?"

Tala and Paco looked at each other for several seconds, and then they shrugged. "Okay," they reluctantly agreed.

"What do you think we should search for first?" Mrs. Yates asked.

"I know what we should do!" Paco announced. "We should . . ."

Paco glanced at his mother, and the sad look on her face made him hesitate. Maybe there was a better way to approach this experiment.

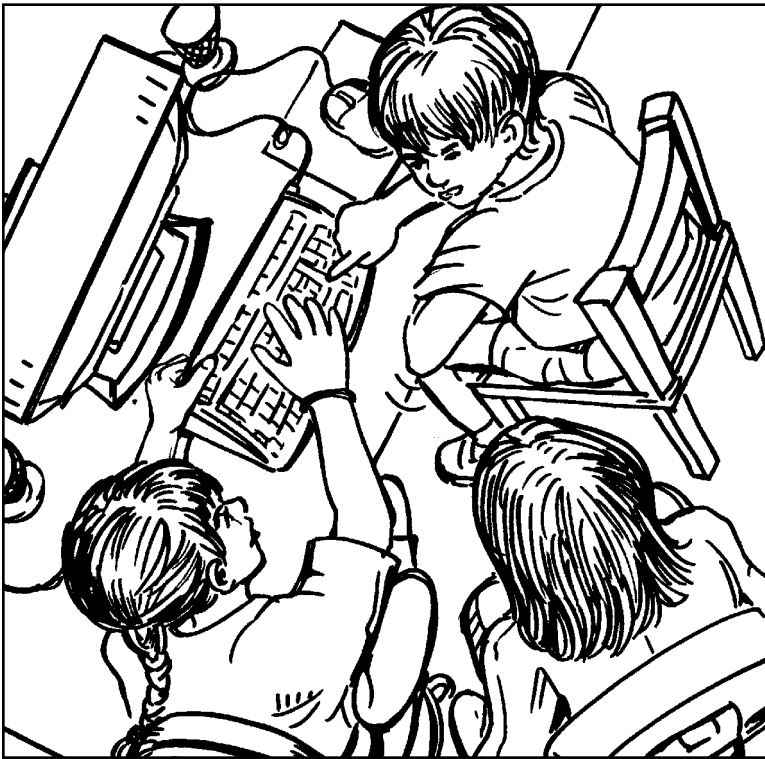
"You can decide," he said to his sister.

"Maybe we should search for the name of our stones," Tala suggested. "Let's type the words *volcanic glass* into the **search engine** and see what web sites come up."

"I don't care about volcanoes!" Paco said. "Let's type in *good-luck stones*."

"Volcanic glass!"

"Good-luck stones!"



Mrs. Yates put a gentle hand on each of their shoulders. When they were quiet, she made a suggestion.

"How about both?" she said. "And how about we add where you found the stones as well?" She typed the words *volcanic glass good luck Apache Leap Mountain* into the search engine and waited to see what would happen. Mrs. Yates knew that the narrower the search, the more likely they were to get the **results** they wanted.

When their search results appeared, Paco and Tala studied them together. One of the short website descriptions mentioned nearly all of the terms they used to search.

"Let's go to that one," the twins said at exactly the same time.

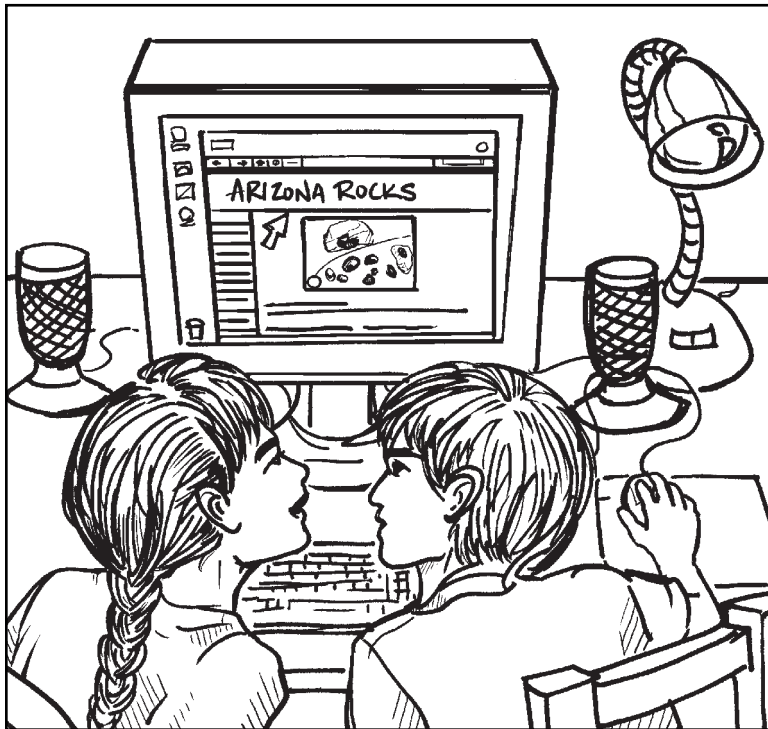
Paco and Tala looked at each other in amazement. They had agreed on something, and even they were surprised.

"Is it okay if I hit the Enter key?" Paco asked.

"That's not fair!" Tala said. "You always get to . . ."

Tala was about to say that Paco always got to do everything, but the look on her mother's face caused her to pause. She sat back and nodded to her brother. Paco pushed the Enter key and waited for the website about the volcanic good-luck stones to load.

As the website was loading, the phone rang and Mrs. Yates went to answer it, leaving Tala and Paco alone without their mother to referee. They both wondered if they could get along without her.



Searching for Answers

The website showed a picture of rocks that looked similar to the shiny stones Tala found. Paco and Tala compared their stones to the ones on the page in front of them and grinned.

"That's our stone!" they said, at exactly the same time.

The twins sat up straight and read the words on the monitor together.

"I told you!" Tala shouted, poking her brother. "Our stones came from inside the earth. They are called **obsidian** and were spewed out from a volcano. So I'm right!"

Paco was too busy reading a different part of the page to listen to his sister and when he was finished, he said, "I'm right! I told you these stones were good-luck stones!"

"See THAT?" Tala said, as she pointed to a word on the part of the page she was reading. Paco followed her finger to the words *volcanic glass* and read that part of the page. Then he focused his sister's attention on the word *good luck* and watched as she read.

"It looks as if we were both right," Paco said.

"I know," his sister agreed. "These stones are probably thousands of years old, they came from inside the earth, and they have brought good luck to many, many people."



"Let's read more about the **legend** of the Apache Tears," Paco said. "It doesn't explain much on this page."

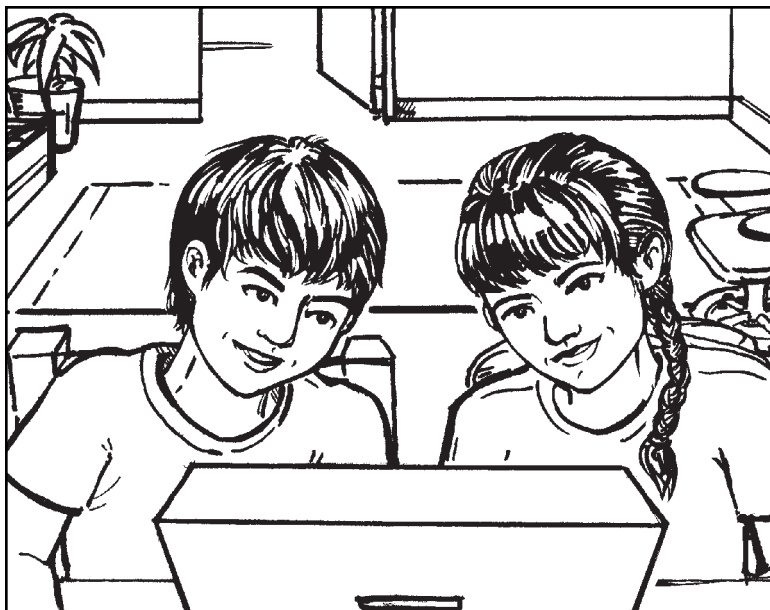
"I guess we should do some more research," Tala suggested.

The twins went back to the search page, typed in *Apache Tears*, and waited as several results came up. One website mentioned the **Pinal Apache**, which was a name given to a band of Apache from near Superior, Arizona, where Tala and Paco lived.

"Let's try that one," Paco said, and when his sister agreed he was happily surprised—a nice feeling.

This webpage showed an illustration of an Apache **warrior**. Tala and Paco read the poem on the webpage slowly and carefully, and when they were finished they read it again.





Paco noticed that his sister was rubbing her stone between her fingers as she read, and he wondered if she was making a wish. Tala didn't usually like legends. She enjoyed reading about science. But Paco could tell that his sister was very interested in this story.

Paco decided that he would read more about volcanoes and all the rocks that were inside the earth, and he would try to understand how the river changed rocks to smooth stones.

For now, Paco and Tala decided to write down their own version of the legend so that they would have it to remember.

Apache Teardrops



The Legend of the Apache Tears

Long, long ago, before the white men came, the Apaches roamed free. But a time came when the white men began to move west in search of new land. Hoping to protect their lands, Apache warriors came out to meet them, but the Apaches were no match for the white men. The white men killed many Apache warriors, and some were driven to the edge of a cliff. Rather than be captured, the warriors jumped from the cliff to their deaths. The Apache women heard of their warriors' deaths, and their sadness was deep and they were filled with great pain. Their despair was so complete that the Great Father embedded their tears into the black stones that rested in the river.

Whoever carries these stones will have good luck always. And whoever keeps these stones close will never again cry tears, for the Apache women have cried tears in their place.

Paco and Tala sat back and studied their stones in silence. They raised them to the light and gazed into their centers. They thought about the women who had cried for their men, and they felt sad. Then they shut down the computer and clenched their stones tight.

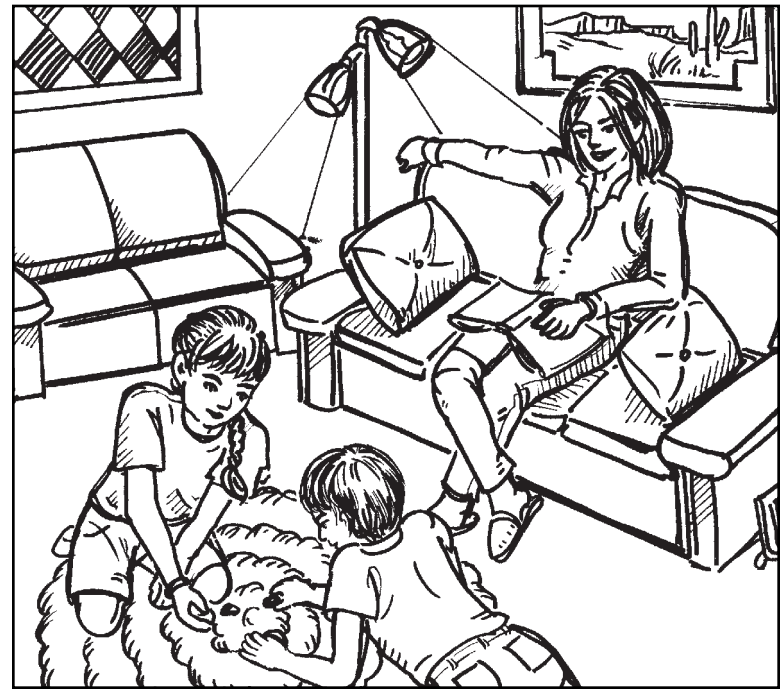
When their mother returned, they told her the Legend of the Apache Tears.

"Can you see the tear of an Apache woman?" Paco asked her, as he held his stone up to the light.



Mrs. Yates took the stone and let the light filter through it. "I think I do see it," she said. "It's a tear for her man, and it's a tear for the sad children he left behind. It's a tear that says 'I wish my children were happy.' "

Paco and Tala understood that she was not just thinking about the Apache children in the legend. She was thinking about them. They understood that their mother wanted them to be happy, but they also knew that they couldn't promise not to fight with each other. They were, after all, brother and sister.





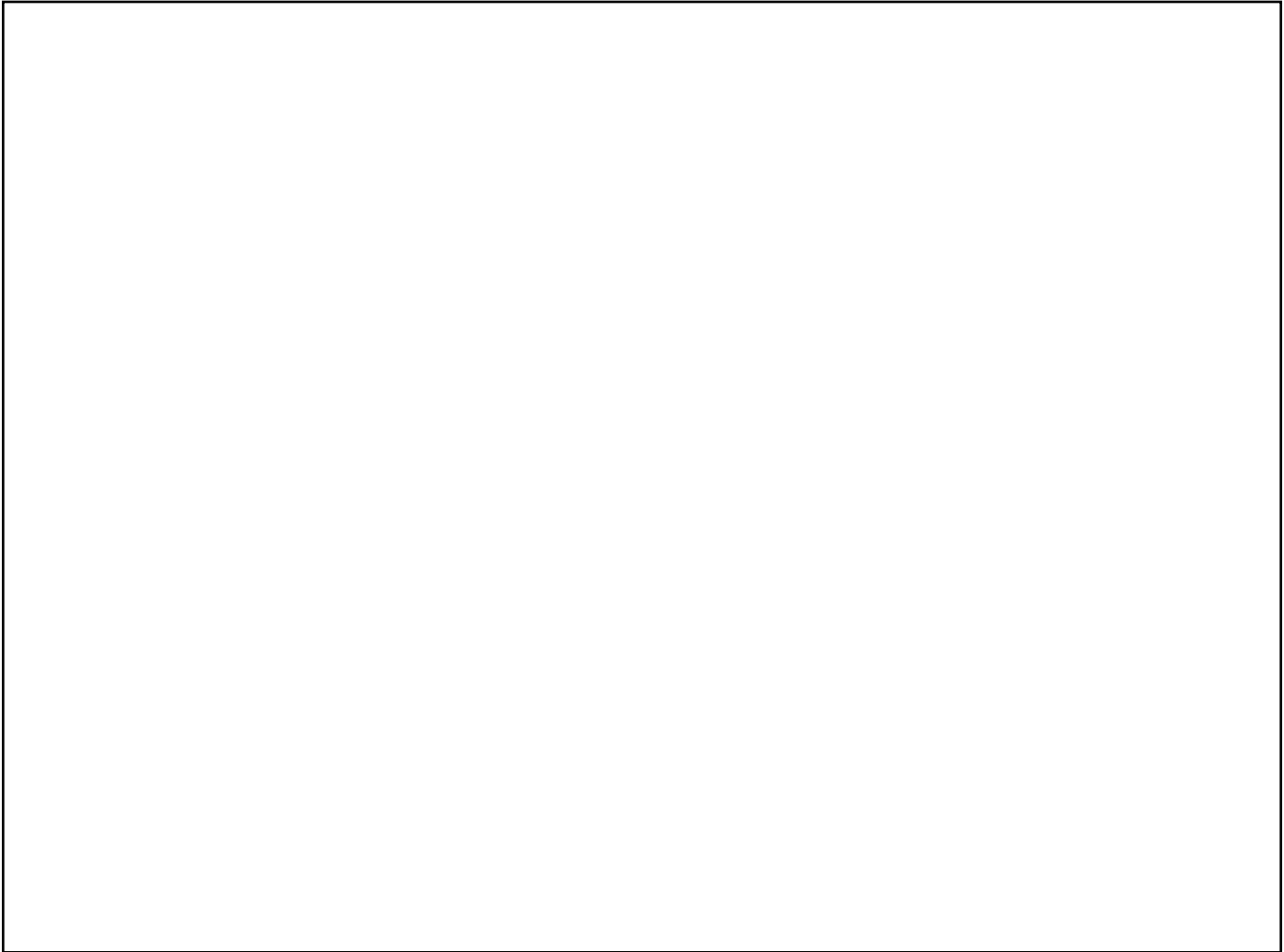
That night, after talking it over, Paco and Tala gave their stones to their mother. At first, Mrs. Yates refused to take them since the stones seemed to have made her children friends again. Eventually, Paco and Tala convinced her that they wanted her to have the Apache Tears. Mrs. Yates slept with the obsidian stones under her pillow that night, and the next day she went to the jeweler and had them made into a necklace. When the necklace was ready, she slipped it on and never took it off again. Apache Tears had indeed brought them good luck!

Glossary

discovered	learned; found out (p. 4)
examine	to check something carefully (p. 7)
experiment	a test or trial (p. 12)
legend	historical story that is believed to be true, but cannot be proven (p. 18)
obsidian	smooth, glassy rock formed when volcanic lava cools rapidly (p. 16)
Pinal Apache	name given by Spanish settlers to a band of Apache Native Americans that lived near the Pinal Mountains of Arizona (p. 18)
polished	to have rubbed an object until it is smooth and glossy (p. 7)
research	to study or investigate (p. 12)
results	outcomes or effects of an action (p. 14)
search engine	computer software that allows users to search data on the World Wide Web (p. 13)
translucent	not clear, but allowing light to pass through (p. 4)
volcanic	of or relating to a volcano (p. 11)
warrior	a person who is or has been in a war (p. 18)
website	a collection of web pages on the World Wide Web (p. 12)

Name _____

INSTRUCTIONS: Draw a picture to represent a part in the story where you stopped to visualize in order to understand what you'd just read.



THE BLACK STONES • LEVEL Z • 1

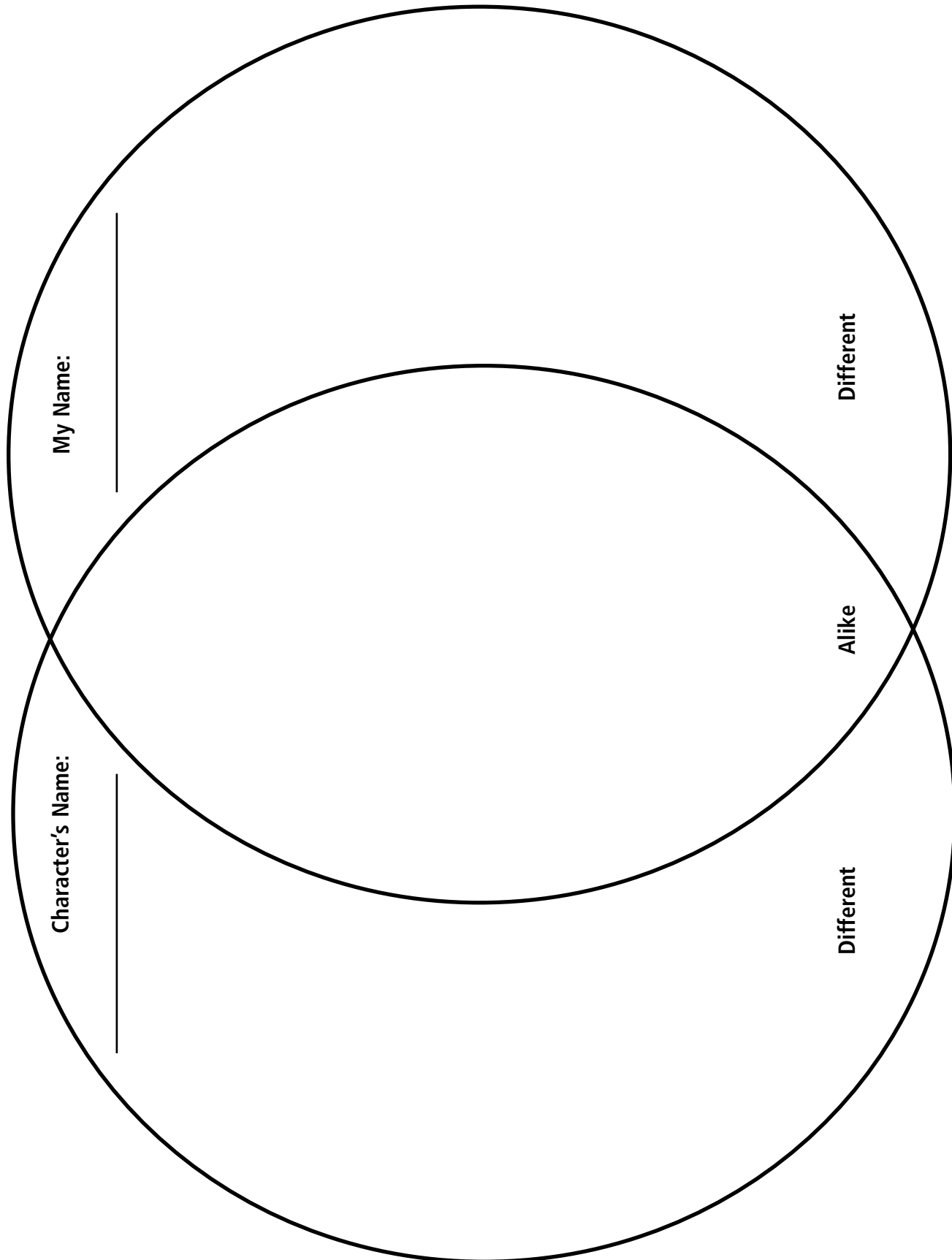
INSTRUCTIONS: Write a description to explain your drawing.



SKILL: VISUALIZE

Name _____

INSTRUCTIONS: Choose a character from *The Black Stones* to compare yourself to. Write the character's name on one line and your name on the other. Where the circles overlap, list how you are like the character. Where the circles are separate, list how you and the character are different.



My Name: _____

Character's Name: _____

Alike

Different

Different

Name _____

INSTRUCTIONS: Match pairs of words in the box from *The Black Stones* to create as many compound words as you can. Then write the compound words you create on the lines at the bottom of the page. Use a dictionary to check your answers if necessary.

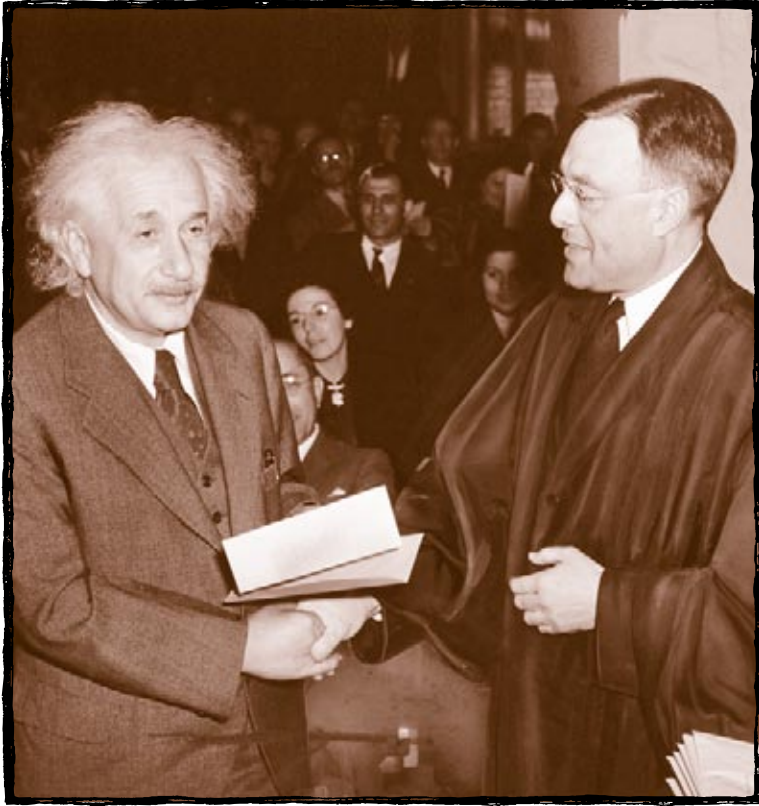
him	star	foot	river	every	self
sun	good	web	search	with	Apache
Pinal	care	Great	fully	Tears	Father
out	engine	side	luck	set	stretched
times	one	day	bank	steps	sea
less	some	thing	shell	her	site

_____	_____	_____
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Albert Einstein

A Reading A-Z Level Z Leveled Reader

Word Count: 2,437

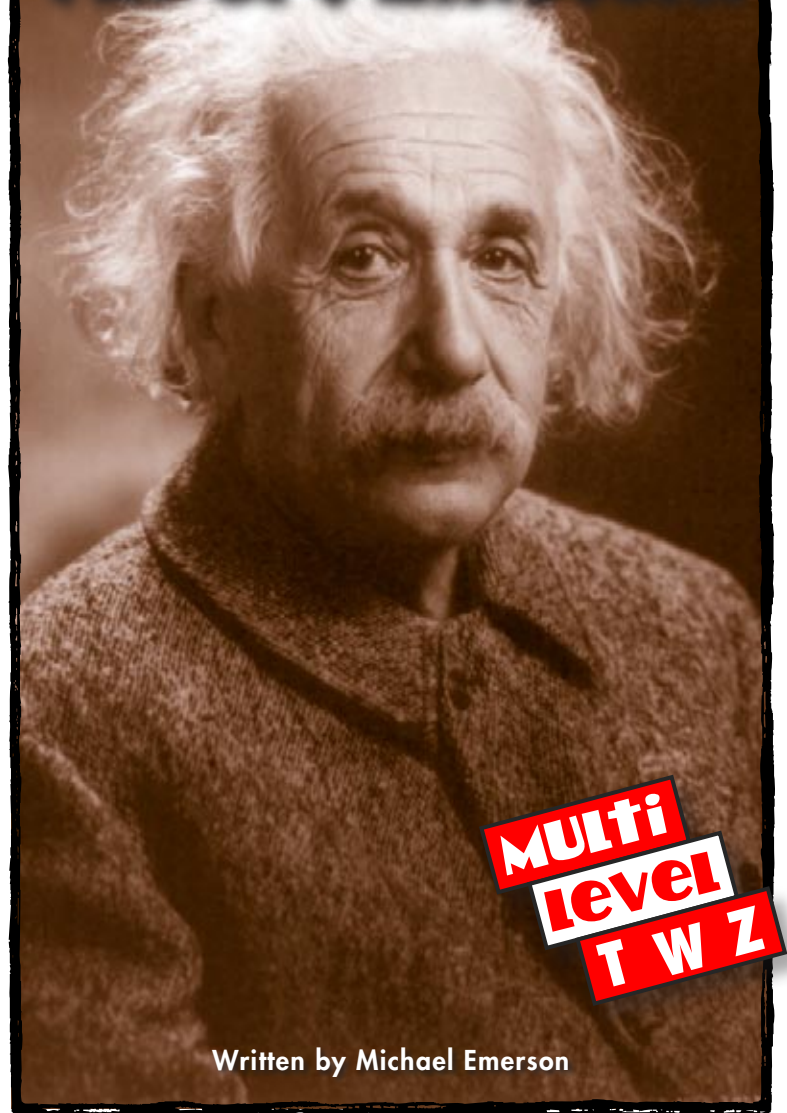


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Albert Einstein

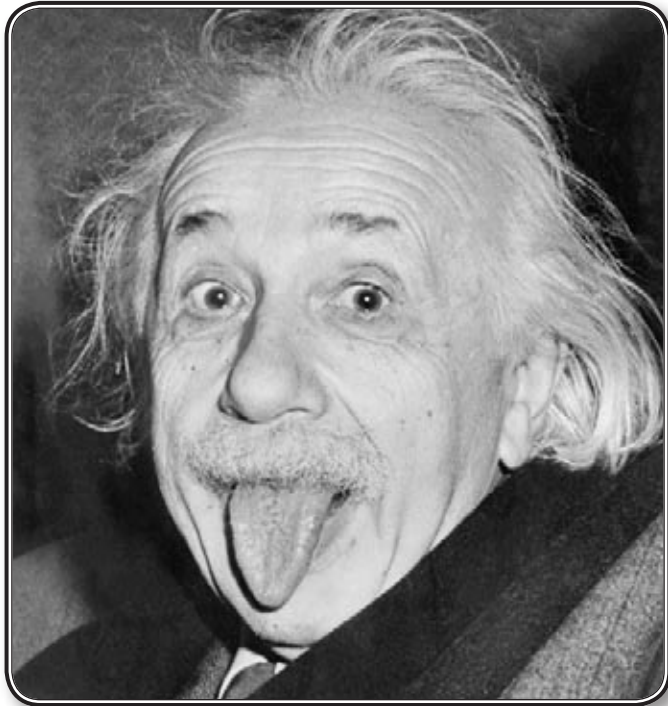


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Albert Einstein



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Back cover: Einstein receives a certificate of U.S. citizenship from Judge Phillip Forman in 1940.

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Table of Contents

Deeply Hidden Things	4
A Talented, Curious Boy	5
The Patent Office	8
The Miracle Year	10
A Rising Star	12
The Uses of Fame	15
Coming to America	17
Einstein's Influence	20
A Life Well Lived	22
Glossary	23
Index	24

Deeply Hidden Things

When Albert Einstein was five years old, his father, Hermann, showed him a **magnetic compass**. Watching its floating movement aroused his curiosity. What caused it to behave the way it did? Why did the compass's needle stay almost still while his father turned the casing around and around in his hand? Why did the needle always point north, as though an invisible hand controlled it?

Einstein was too young to understand the answers, but he never forgot the feeling of wonder and mystery. Later, he wrote that watching the compass had taught him an important lesson, that "something deeply hidden" had to be "behind things." That curious little boy grew up to become a curious scientist who spent his life trying to identify that "something." By continuing to pursue his curiosity, Albert Einstein forever changed the way people think about the universe in which we live.



Einstein's curiosity about complex problems led to great discoveries.



Einstein played the violin from childhood through adulthood.

A Talented, Curious Boy



"A table, a chair, a bowl of fruit and a violin; what else does a man need to be happy?"

Albert Einstein was born on March 14, 1879, in the small town of Ulm, Germany. The next year, the family moved to the larger city of Munich, where Albert's younger sister, Maja, was born. Maja would become his closest childhood friend.

Einstein's entire family had a strong influence on his life. His mother, Pauline, played the piano, and she shared her love of music with her son. When Albert was six, she encouraged him to take up the violin, and although he disliked the required structure of his lessons, he found that he loved playing the instrument. His violin would be a constant companion for the rest of his life.



Albert Einstein with his sister, Maja

Do You Know?

As a child, Einstein had a common childhood speech habit that worried his parents. Whatever the young Einstein said aloud, he would often repeat to himself, in a very quiet voice. It was as if he was "rechecking his words," to see if they were correct. He eventually grew out of this peculiar habit and became an accomplished public speaker.

Other family influences also shaped his future. Einstein's father and two of his uncles were electrical engineers. They introduced Einstein to math and science at an early age; one of his uncles taught him the basics of **algebra** by making it into a game. A family friend, a medical student who came to dinner once a week, brought him science, math, and philosophy books, and Einstein would **pore** over the books for hours at a time. He was especially enthralled with a book about geometry, although the books about philosophy also helped to shape the scientist—and the person—he would become. Even as a child, Einstein had the ability to concentrate deeply, and he would pursue complicated problems until he was satisfied that he had considered every solution.

In school, Einstein's talent for math and science was apparent immediately; however, so was his individuality. To young Einstein, the teachers seemed like army sergeants who only drilled their students to memorize useless information and lifeless facts instead of encouraging them to think independently and seek new answers. Einstein preferred his own brand of creative thinking. His objections in class caused disruption. Eventually, one of his teachers suggested that he leave the school altogether because his attitude was diminishing the class's respect for the teacher.

Both Einstein and his teachers were relieved when he finally left this school at 15, to join his parents in Italy. The family had moved there to start a new business, but shortly after they settled in Italy, Einstein moved again, this time to finish school in Switzerland.

When he was only 17 years old, Einstein was accepted at one of the finest scientific universities in Europe. He often skipped routine lectures to spend more time in a laboratory developing his own ideas. Most of his university professors agreed that their brilliant young student might have a very bright future if only he would learn to follow established rules.

The Patent Office

Einstein had trouble finding a job after finishing school in 1900. Certainly, he had been an unquestionably bright student, and he had graduated from one of the finest universities in Europe. However, his strong sense of independence and his curiosity had made him unpopular with the very teachers who could have helped him find the work he desired. A teaching position would have given him the freedom to pursue further study. Dismayed, but not discouraged, Einstein didn't give up his interest in science. He had ideas that he wanted to think through and test. He just needed to find the time and place to pursue them.

Einstein found both the time and place in 1902, when he took a job as a clerk in a **patent** office, in Bern, Switzerland. His unusual job was to make sure that devices submitted for patent certification worked the way their inventors claimed they did.

The job in the patent office allowed Einstein to do what he did best—pursue his curiosity and question the ideas of others. On his first day at work, Einstein's boss told him, "When you pick up an application, think that anything the inventor says is wrong."

Do You Know?

Einstein himself held several patents. One patent was for a compass that was not affected by the presence of large amounts of iron. The compass became standard equipment on metal ships and submarines. He also held a patent for a quieter, safer pump for refrigerators.

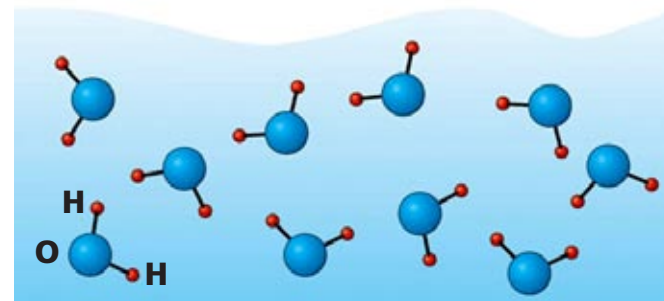


The security of a reliable salary and regular working hours gave Einstein the freedom to work on his own ideas. In his spare time, he met with a group of friends who shared his curiosity about the scientific ideas of the day as well as about developments in philosophy and mathematics. They called themselves the Olympia Academy, and their enthusiastic exchanges often went on until late in the evening, as they talked and socialized in cafes or in Einstein's apartment. It was during those years of steady work and strong friendships that Einstein began to develop ideas that would change science forever.

The Miracle Year

By 1905, Einstein had worked in the patent office for three years, and during that time, his thriving curiosity had led him to research, study, and give a great deal of thought to new scientific theories. He soon felt confident enough in his results to share the ideas that he had developed.

Einstein sent papers explaining his ideas to the leading German scientific journal of the time, *Annalen der Physik*. The journal published the first of these papers in March 1905, and four additional papers soon followed. Einstein's first paper explained his ideas about the nature and behavior of light. In the second and third papers, he proved the existence of tiny parts of matter, called molecules and atoms, and described how they moved. His final two papers offered new explanations for understanding the relationships existing among space, time, and objects in motion.



Water molecules (H₂O)

Scientists were astounded by what they read in his paper. Where had these unique ideas come from? But some were also angered, as they found their life's work suddenly diminished. In a mere six months, Einstein changed over two hundred years of accepted scientific thought about the content and behavior of the known universe. The scientific community was equally amazed that these ideas came not from a professor of **physics** at a major university, but from a curious, 26-year-old patent clerk.

Immediately after the publication of his ideas, Einstein's scientific career took off in many directions. He was further energized by the attention his work received from the scientific community and by the opportunities that were open to him. He received invitations to speak at scientific meetings and to explain his new ideas. The 1905 Nobel Prize winner in physics personally congratulated Einstein. A well-known and highly respected professor of physics named Max Planck even began to teach Einstein's ideas to his students. In time, 1905 came to be known as Einstein's "miracle year."



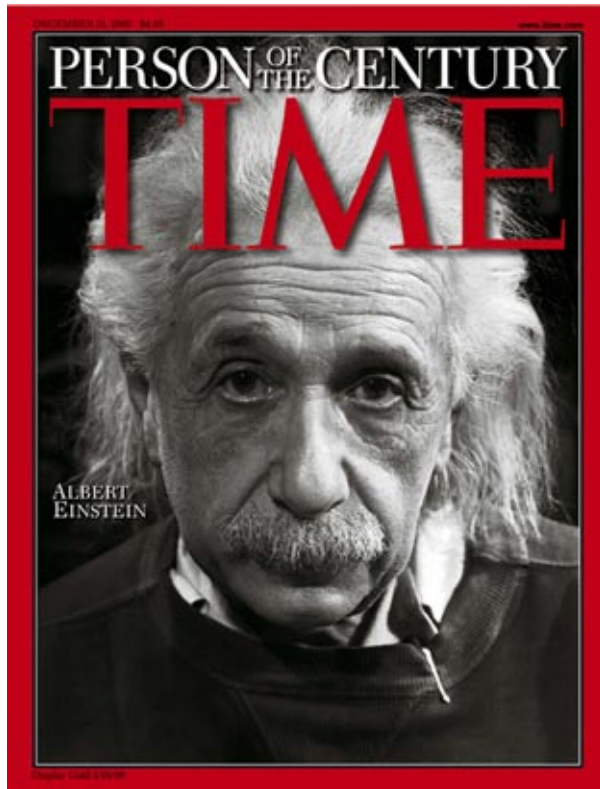
"The most incomprehensible thing about the world is that it is comprehensible."

A Rising Star

Einstein continued to work at the patent office until 1909. That year, he was gratified to finally receive an offer for a full-time job at a university. Einstein accepted the position but then characteristically jumped from school to school for the next few years, still searching for the ideal place to pursue his research.

Meanwhile, he continued to develop and refine his earlier ideas in new ways, which was hard work, and several times Einstein thought he was on the wrong track. He could be highly self-critical. In fact, his ideas were so new and unfamiliar that he said they almost drove him insane. Then, in 1915, he had a breakthrough—he finally determined how to unite his earlier individual ideas into one system, which he called the General Theory of Relativity.

Einstein's ideas once again excited scientists around the world. In 1919, British scientists tested Einstein's theory by measuring the position of a star during a solar eclipse. If Einstein was correct, the star would appear to be in one position while it was actually in another. To the astonishment of many, the star appeared almost exactly where Einstein said it would be!

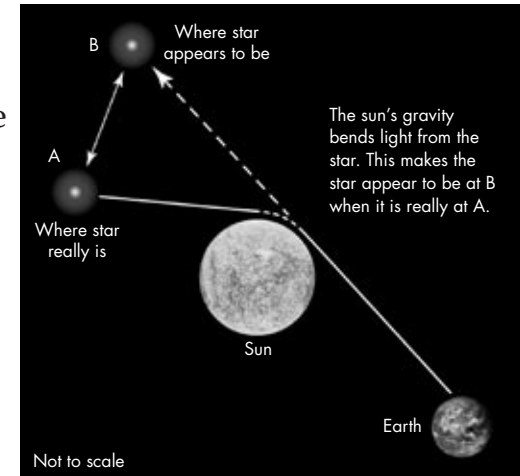


Newspaper headlines around the world announced the findings. A British newspaper declared, “Revolution in Science—New Theory of the Universe.” A German newspaper called Einstein a “new celebrity in world history” and said that his ideas were “a complete revolution in our concepts of nature.” Overnight, Albert Einstein became one of the most famous people in the world. Some would eventually proclaim, with good reason, that he was the most influential person of the twentieth century.

Despite his success and the wide acceptance of his theories, not everyone was pleased with Einstein. Many scientists had built their careers on ideas that Einstein

tossed aside, and others did not want to believe Einstein’s theories because they would be difficult to test in a laboratory. Some people simply disliked Einstein because he was a Jewish man living in a country where prejudice against many groups of people was growing. Over the next few years, Einstein’s friends increasingly feared for his safety.

Although Einstein would become a vocal opponent of the rising prejudice in Germany, he took the professional criticism of his work in stride. He knew that his theories were not perfect, yet with each new paper published, more and more people came to believe Einstein’s work was critically important. In 1922, Einstein was awarded the **prestigious** Nobel Prize in physics.





News reporters greet Albert Einstein and Elsa, his wife, arriving in New York in 1921.

The Uses of Fame



"Try not to become a man of success but a man of value."

As Einstein's fame grew, so did the demand for interviews, photographs, speeches, and writings. Einstein had mixed feelings about all this attention. These demands on his time interrupted his research, and he realized that many people would continue to misunderstand his ideas no matter how carefully he explained them.

Despite his concerns, Einstein also knew that fame could open the minds of more people and allow him to bring his ideas to wider audiences. The more speeches and interviews he gave, the more people would hear about his theories and try to understand the world as he saw it.

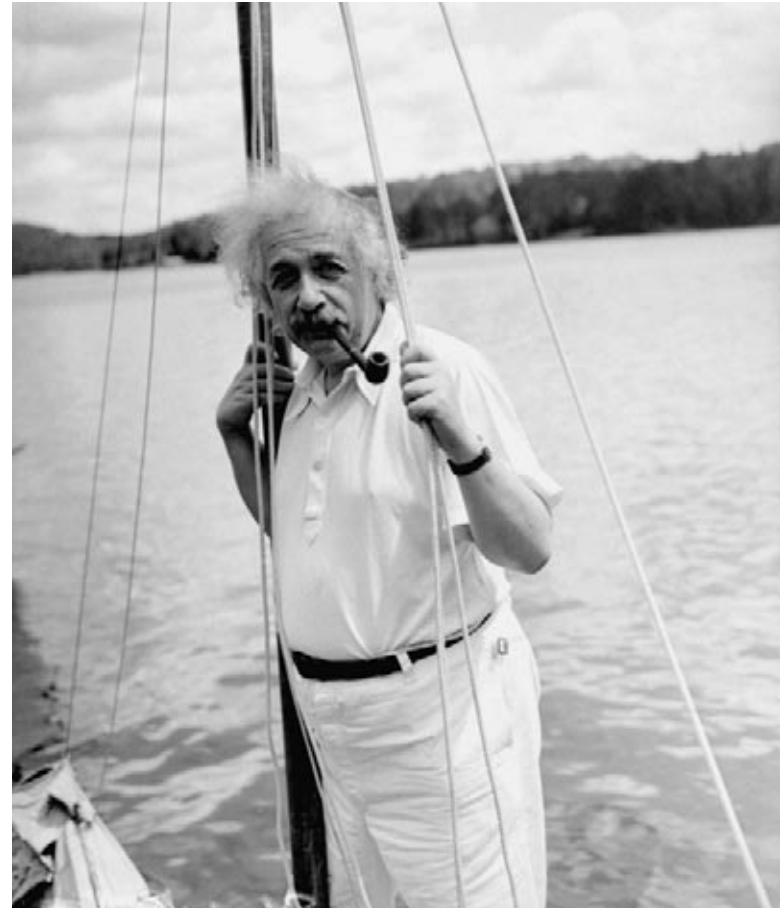
Einstein also knew that he could use his fame to draw attention to issues he cared about outside of science. One of Einstein's most deeply held beliefs was that war should be avoided if at all possible. In 1914, he was one of only three scientists who signed a letter speaking out against German militarism and against the country taking part in World War I. More than 100 scientists had signed a letter supporting Germany's entry into the war. Now that he had gained the world's attention through his scientific work, he increased his participation in antiwar efforts, publicly supporting international groups working for peace. He wrote often about his antiwar beliefs. When Germany began preparing for war again in the 1920s and 1930s, Einstein continued to write and speak out.

Einstein also believed strongly in creating a new Jewish country, to be called Israel, in the Middle East. He **advocated** a world government over **nationalism**, but after witnessing the rising violence and hatred against Jews in his homeland, he felt that Jewish people should unite in any way possible. Beginning in 1921, he became more visible in his support of the Jewish cause. In 1952 he was offered the presidency of the new country of Israel, which he respectfully declined.

Coming to America

Despite the efforts of Einstein and others to promote peace, Germany moved closer to war in the 1930s. Until this time the German government had tolerated Einstein, his fame, and his criticism of their plans, but Einstein knew this tolerance would not last. In 1933, following a series of annual lectures in the United States, he sailed to Belgium to formally give up his German citizenship. Without returning to his home in Germany, Einstein accepted a position with the Institute for Advanced Study at Princeton University in the United States. In reaction, German military troops seized much of his property, publicly burned many of his papers and books and denounced him as a traitor.

Einstein meets with Jawarhalal Nehru, prime minister of India, at Einstein's home in Princeton, New Jersey in 1949.



Einstein enjoyed sailing, and often took his boat out on Princeton's Lake Carnegie.

At Princeton, Einstein moved his family into a house close to his office. They soon became part of Princeton's close-knit community. When out-of-town visitors wanted to know where the great man lived, townspeople would ask, "Are you expected?" This question prevented strangers from bothering Einstein at home.

For the next 22 years, Einstein continued working to expand his ideas into new areas. Some people thought that his efforts showed that he was losing touch, but Einstein didn't pay much attention to this criticism. He believed that he could develop a new theory that would unify his ideas with the latest theories. He remained dedicated to his work and his ideas, yet he never achieved the sort of breakthroughs he'd had during the "miracle year" or with his General Theory of Relativity. Always in demand, he continued to give speeches, write articles, and meet regularly with fellow scientists.



Albert Einstein goes over matters with secretary Helen Dukas, who worked with Einstein from 1928 until his death in 1955.

Einstein's Influence



"Few are those who see with their own eyes and feel with their own hearts."

Einstein was not an inventor, yet his curiosity led to the creation of many useful products. For

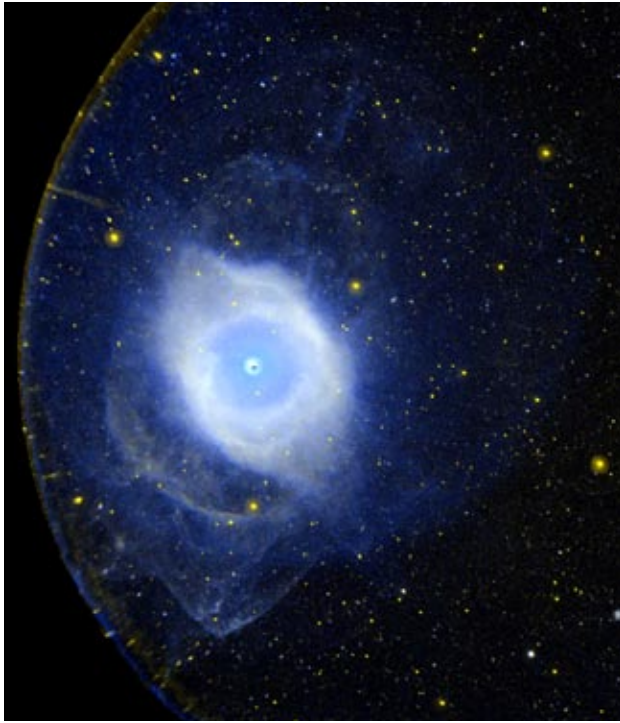


example, Einstein's ideas about the nature and behavior of light led scientists to develop new ways to control light, and these new technologies eventually

led to the production of television cameras, remote controls for home electronics, and flat-screen computers. Einstein was also the first person to think of laser light, a technology that is now used in compact discs (CDs), digital video discs (DVDs), and supermarket checkout

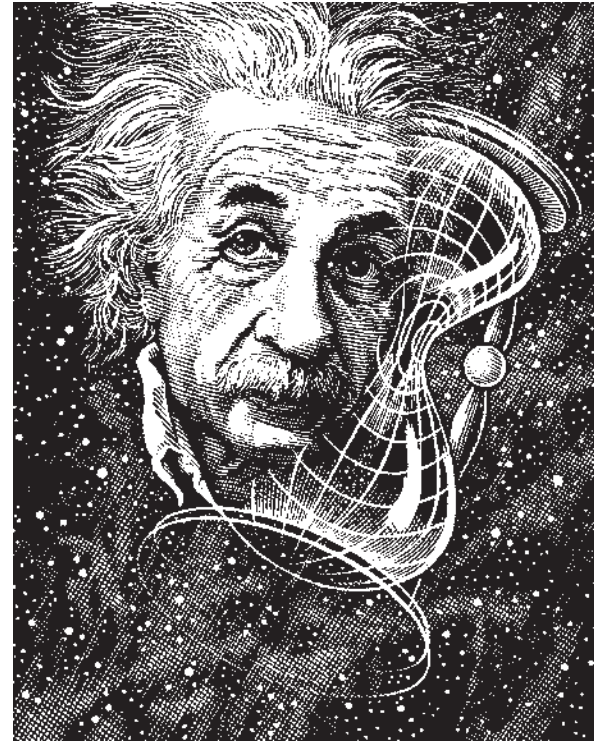


equipment. His proof of the existence of atoms and molecules led to the creation or improvement of a wide range of products, including shaving cream, toothpaste, personal computers and cell phones.



Einstein's theories provide scientists with a framework to study space objects, such as the Helix Nebula.

Einstein's scientific ideas continue to influence new theories and technologies. Current ideas about the origins of the universe, the nature of space and time, and strange, intriguing objects called black holes all owe a large debt to Einstein's work and original thinking. Einstein's discoveries and equations provided the foundation for scientists to comprehend many aspects of the universe. Scientists have only recently been able to test and confirm some of Einstein's most interesting theories.



A Life Well Lived



"The important thing is to never stop questioning."

Einstein once said, "The most beautiful experience we can have is the mysterious. . . . It is enough to try to understand a little of this mystery every day."

Until his death on April 18, 1955, Einstein's curiosity led him to work to understand nature's greatest mysteries. In doing so, he changed the way people think about time, space, energy, and matter—the foundations of the universe.

Glossary

advocated (<i>v.</i>)	supported or recommended (p. 16)
algebra (<i>n.</i>)	a branch of math in which symbols, usually letters, are used to represent unknown numbers (p. 6)
atoms (<i>n.</i>)	tiny pieces of matter (p. 10)
influential (<i>adj.</i>)	having the power to shape events (p. 13)
magnetic compass (<i>n.</i>)	a direction-finding tool with a needle that always points north (p. 4)
molecules (<i>n.</i>)	the smallest parts of a substance that are still identifiable as that substance (p. 10)
nationalism (<i>n.</i>)	the belief in the success and independence of one's own nation (p. 16)
patent (<i>n.</i>)	a document that grants an inventor the right to make money from an invention (p. 8)
physics (<i>n.</i>)	the scientific study of matter and energy (p. 11)
pore (<i>v.</i>)	to read with great attention (p. 6)
prestigious (<i>adj.</i>)	having honor, respect, or high standing (p. 14)
revolution (<i>n.</i>)	an overthrow of previous ideas or ways of doing things (p. 13)

Index

beliefs, 16	Olympia Academy, 9
black holes, 21	papers, 10, 11, 17
born, 5	patent office, 8, 10, 12
compass, 4	patents, 8, 10, 11, 12
criticism, 14, 17, 19	peace, 16, 17
curious, 4, 5, 19	philosophy, 6, 9
curiosity, 7, 8, 9, 10, 20, 22	Princeton University, 17
fame, 15, 16, 17	public speaker, 17
family, 5, 6, 7, 18	research, 10, 12, 15
father, 4, 6	revolution, 13
General Theory of Relativity, 12, 19	school, 7, 8, 12
inventor, 8, 20	scientific theories, 10
Israel, 16	scientist(s), 4, 6, 11, 12, 14, 16, 19, 20, 21
job, 8, 12	sister, 5
journal, 10	solar eclipse, 12
laboratory, 7, 14	uncles, 6
laser light, 20	United States, 17
magnetic, 4	universe, 4, 11, 13, 21, 22
miracle year, 10, 11, 19	violin, 5
mother, 5	war, 16, 17
mysterious, 22	work, 7, 8, 9, 11, 12, 14, 16, 19, 21, 21, 22
Nobel Prize, 11, 14	

Name _____

INSTRUCTIONS: In the first column, write what you already know about Albert Einstein. In the second column, write what you would like to learn about him. After you finish reading, fill in the third column with information you learned from reading the book and the fourth column with what you still want to know.

(K) What I Know	(W) What I Want to Know	(L) What I Learned	(S) What I Still Want To Know

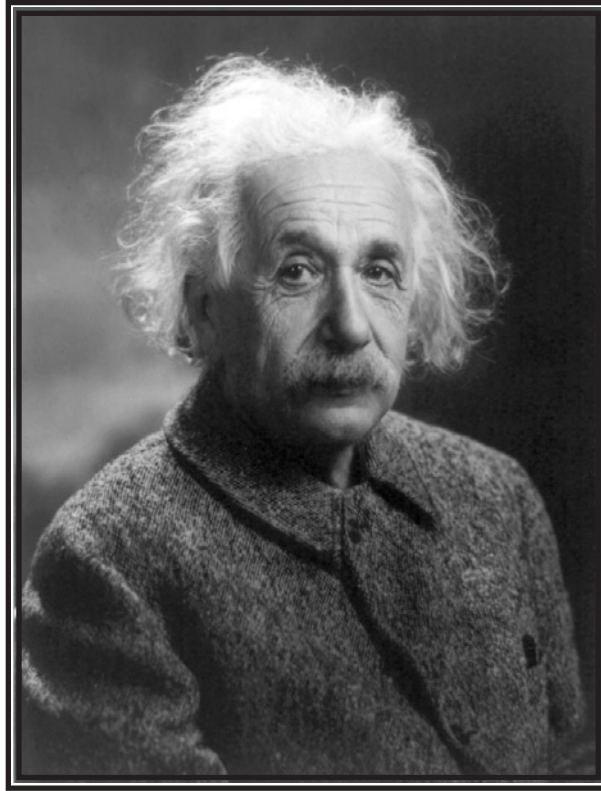
Reading a-z

Book/Topic: _____

[illegible]

Name _____

INSTRUCTIONS: In the sentences below, circle the adjectives and adjective phrases. Then underline the noun or nouns they describe.



ALBERT EINSTEIN • LEVEL Z • 3

1. Einstein was a well-taught individual with unique ideas.
2. The great ideas came from a curious 26-six-year-old patent clerk.
3. A well-known professor of physics began to teach Einstein's new ideas.
4. He finally received an offer for a full-time job at a prestigious university.
5. They soon became part of Princeton's close-knit community.
6. Out-of-town visitors wanted to know where the great man lived.
7. Einstein was an intelligent, German-born man.
8. He could be highly self-critical.
9. Einstein's ideas about what light is and how it behaves led scientists to develop new technology such as flat-screen computers.

SKILL: COMPOUND ADJECTIVES

Building a Nation

A Reading A-Z Level Z Leveled Reader

Word Count: 2,183




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Building a Nation



Part Three of The American Revolution
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Part Three of The American Revolution

Building a Nation at Level Z tells about the efforts of thirteen colonies to build a nation. Read *Seeds of Revolution* at Level X and *Battling for Independence* at Level Y to find out what events led to the creation of the United States of America.

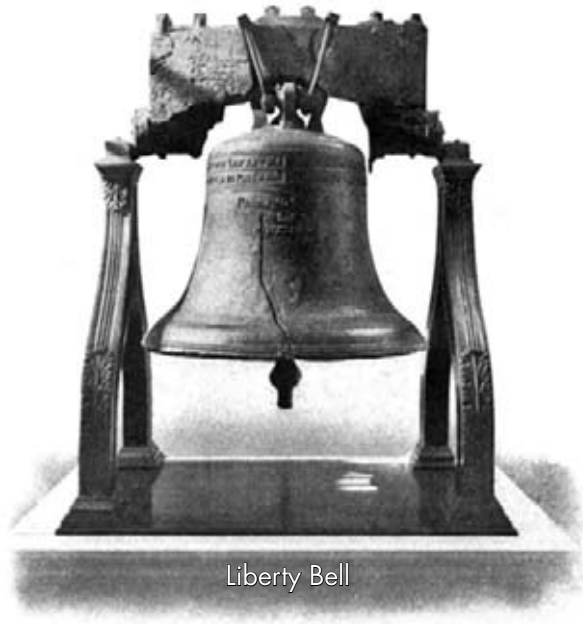
Building a Nation
Level Z Leveled Reader
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Part Three of The American Revolution
Written by Terry Miller Shannon
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Liberty Bell

Table of Contents

Introduction	4
The Articles of Confederation	5
The Treaty of Paris	7
Money Problems	9
Constitutional Convention	10
Arguments Over Land	16
The Louisiana Purchase	18
Exploration and War	19
Timeline of the American Revolution	22
Glossary	23
Index	24



Colonists fight British soldiers at Brandywine Creek in Pennsylvania.

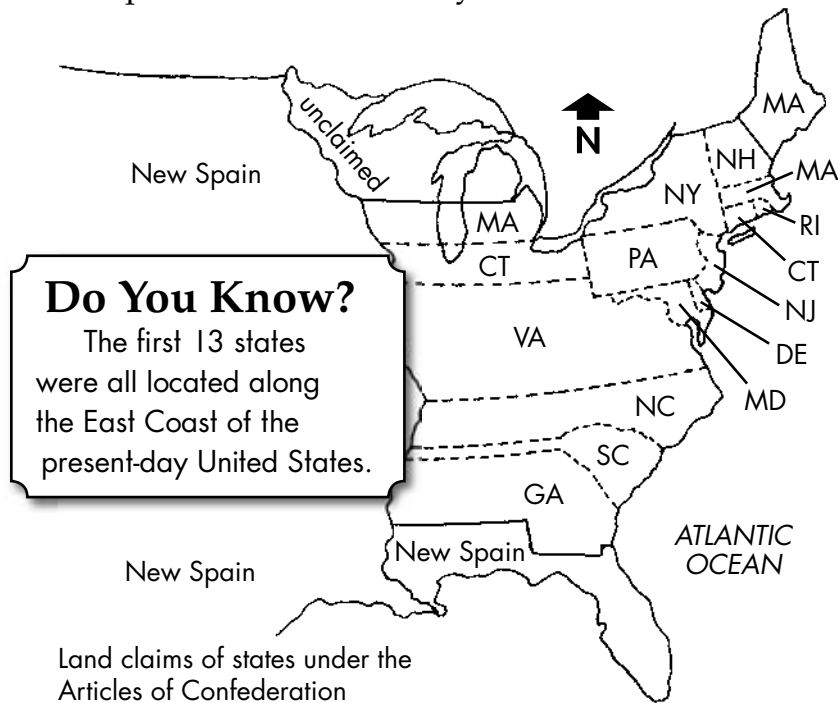
Introduction

In 1776, the 13 British colonies in North America signed the Declaration of Independence, proclaiming they were free and independent of Great Britain's rule. At the same time, the colonies declared themselves a union of states called the United States of America. After that, the union of states needed to devise a system of government.

Delegates from the original 13 colonies, now called states, began to draft a plan, in 1776, for a government. It would take five years for this plan to be firmly established within the new union of states because war with Great Britain continued. However, it would take another 40 years and another war with Great Britain for this new union to feel truly united.

The Articles of Confederation

In 1777, delegates **appointed** by each state to the Second Continental Congress agreed to send the new plan for government to the states for review. The document detailing the plan would become known as the Articles of Confederation. It did not refer to the United States as a nation, but as a “firm league of friendship” between 13 states. The document set up a weak federal government and strong state governments. The states liked the **authority** and **freedom** they had under the Articles. Each state created its own **constitution** and printed its own money.



The Articles of Confederation gave the federal government of the United States no authority and no freedom to act. The United States had **debts** from the war, but Congress, the one branch of federal government created by the Articles, could not tax people to raise money to pay off the



The Articles of Confederation

debts. The lack of power to tax would prove to be one of the Articles of Confederation's fatal flaws. The document had other flaws as well, including that no one executive was in charge. A president was elected to oversee the proceedings of Congress, but had no power to make decisions. Congress also did not have the power to change the Articles if the union of states decided something about the plan was not working. Nine of the 13 states had to agree to changes in the Articles. It would take several years after its approval by the states for the Articles of Confederation to show its flaws.

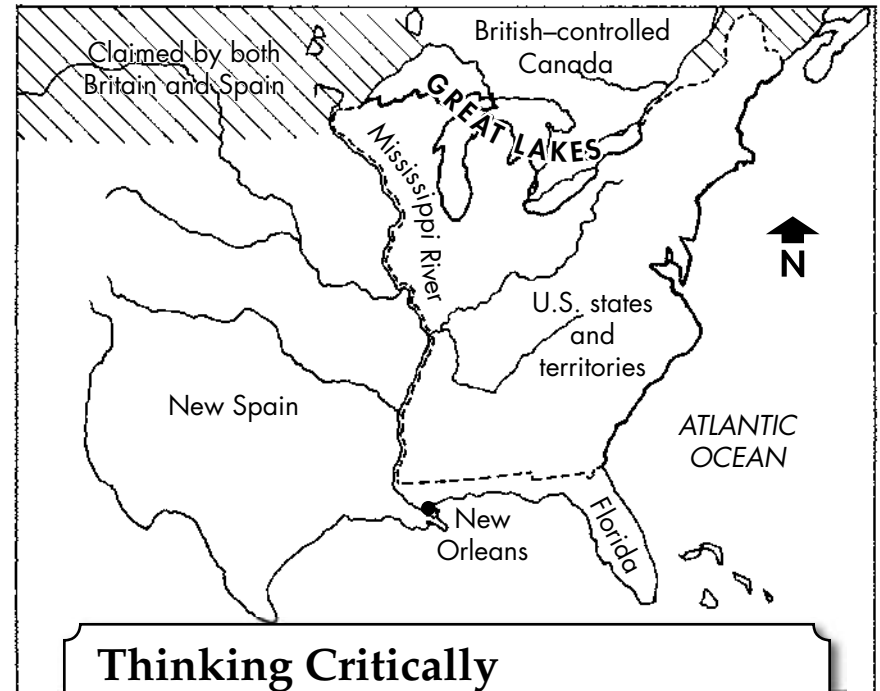
The Treaty of Paris

It took almost five years for all 13 states to come to an agreement and approve the Articles of Confederation. In 1781, the major fighting of the Revolutionary War ended with U.S. General George Washington's win over British General Charles Cornwallis at Yorktown, Virginia, but the war itself wasn't officially over for two more years.

Representatives from the United States and Great Britain discussed peace terms in Paris, France, from the middle of 1782 until the Treaty of Paris was signed on February 3, 1783. Only then had the war officially ended.

The **peace treaty** established two important ideas:

1. It recognized the new United States to be independent of Great Britain.
2. It also set the boundaries of the new United States. It included all land from the Atlantic Ocean west to the Mississippi River with the exception of New Orleans and the Floridas, which Spain controlled. The United States' northern boundary was set at the Great Lakes and along the borders of Quebec and Nova Scotia, both part of British-controlled Canada.



Thinking Critically

WHY was it important for the U.S. to be recognized in the Treaty of Paris as independent of Britain?

IN YOUR MIND, what might have happened if the treaty did not recognize U.S. independence?

Why Did It Take So Long?

The Treaty of Paris was not signed until two years after the war ended at Yorktown. Great Britain was in no hurry to please the United States. Britain also hoped a delay would increase the chances that colonists who had fled the colonies due to their loyalty to Britain would get paid for property they lost when they fled. Estimates vary on how many colonists loyal to Britain left during and after the war, but some put the number around 100,000.

Money Problems

Once the Revolutionary War was over and the Treaty of Paris signed, there were terrible money troubles for the United States. Soldiers headed home, poor and tired. The government had no money and no power to tax, so many of the soldiers were not paid. But an even bigger money headache faced the new nation: war debts. The nation owed more than \$76 million to foreign countries, individual Americans, and state banks. Leaders did not know how they would raise the money to pay off the huge debts.

In Massachusetts, money problems at home inspired a **rebellion**. Farmers who fought for independence could not pay their debts and lost their farms. In 1786, Daniel Shays, a former Revolutionary War captain, and about a thousand farmers and other workers marched on the town of Springfield, Massachusetts, and then headed to Boston. The U.S. army met them there, and gunfire was exchanged. Some of the workers were tried and hanged while others were not punished. Shays' Rebellion persuaded many citizens and leaders that a stronger federal government was needed.



This silver U.S. dollar wasn't made until 1795.



Constitutional Convention

To solve the many problems of the United States, 55 men arrived in Philadelphia, Pennsylvania, for a meeting at Independence Hall



Independence Hall

in May 1787. The goal of the meeting was to change the Articles of Confederation to make the federal government stronger. They would work on drafting a constitution that would establish an executive to lead the union, give Congress the power to tax, and create a way to change the governing document.

Twelve of the 13 states sent delegates. Each delegate was an influential leader in his own state and was also known as a leader in the new union. All the delegates were wealthy, educated white men. The delegates elected George Washington to preside over the meeting, which became known as the Constitutional Convention. The convention would last for several weeks.

Debates over revisions to the Articles of Confederation raised tempers on two issues related to power in the new government. The first issue was representation. More representatives in Congress would equal more power, so two plans were proposed. One based representation on **population**, which meant more representatives for states with more people. The other plan made representation equal for all states.

The second issue was slavery, which was important to the farming economy in the southern states. Slaves were people who were forced to work without pay. Southern states not only wanted to ensure they could keep their slaves, but also that they could have slaves counted for representation—even though slaves could not vote. The delegates for the southern states thought that by counting slaves for representation, their states would be on more equal footing with the northern states, which had more people.

An editorial cartoon shows debates during the Constitutional Convention.



The delegates developed a **compromise** on both representation and slavery. For representation, they created two houses of Congress. In the Senate, all states would be equally represented. In the House of Representatives, states would be represented based on their population. On the issue of slavery, the delegates prohibited Congress from making any changes to control slavery for 20 years. They also agreed to count slaves as three-fifths of their population. Delegates also debated how much power the president should have. So they developed a system of **checks and balances** by which each power given to one branch of the government would be matched with equal power given to the other two branches. Three branches were proposed in all—a legislative branch with two houses of Congress, an executive branch with a president, and a judicial branch with a system of courts to enforce laws. A system to change the Constitution was also built into the document.



On September 17, 1787, the delegates of the convention signed the Constitution and sent it out to the states for a vote. People everywhere debated whether the Constitution created a good plan for government. A group called the



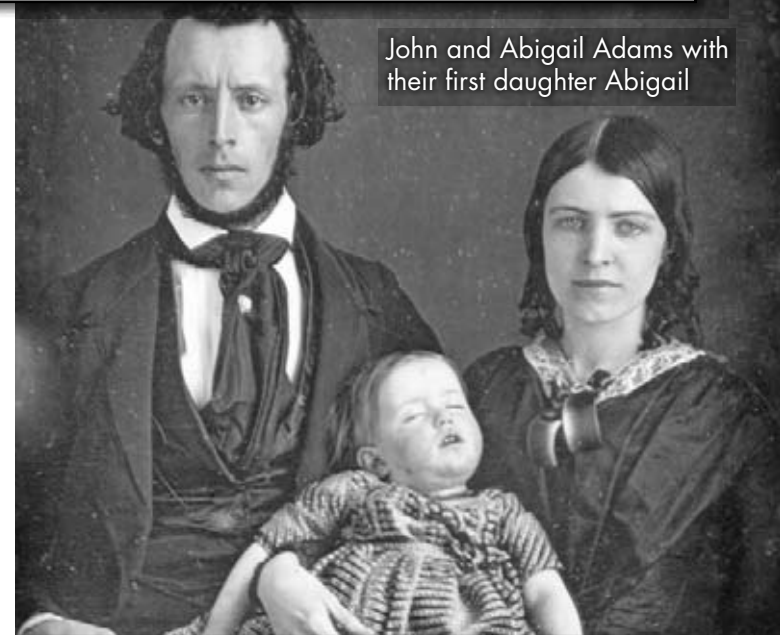
Federalists liked the Constitution and worked to get states to **ratify** it. Another group called the Antifederalists did not like the Constitution and worked against it becoming the law of the land.

The Antifederalists said the Constitution needed to list the rights that belonged to the people and could not be taken away by the government. Eventually, the two sides would reach an agreement, and all 13 states would vote in favor of the Constitution. The agreement between the Federalists and the Antifederalists included 10 changes to the Constitution, which were called the Bill of Rights. The Bill of Rights **guaranteed** the right to free speech, the right to practice a religion, and others.

Thinking Critically

WHY did the delegates compromise on so many issues to create the Constitution?

IN YOUR MIND, how does compromise make things stronger?



John and Abigail Adams with their first daughter Abigail

Liberty for All?

Slaves were not free, and neither were women. Women weren't able to vote, and pretty much had to do as their husbands or fathers told them. John Adams' wife, Abigail, frequently mentioned this fact to her husband:

"Whilst you are proclaiming peace and goodwill to men . . . you insist upon retaining an absolute power over wives," she wrote to John. In another letter, she wrote: "In the new code of laws . . . I desire you remember the ladies . . ."



George Washington
President 1789–1797

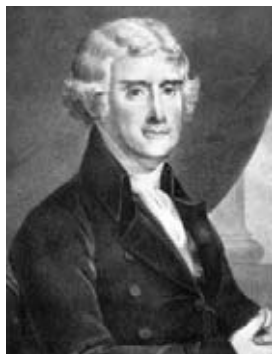
Under the new Constitution, George Washington was elected president of the United States of America and took office on April 30, 1789. Many people felt he was a great leader. He served two four-year terms as president of the United States.



John Adams
President 1797–1801

During his first term, Washington appointed Alexander Hamilton as secretary of the treasury. Hamilton's plan to fix the new nation's many money problems included taxes on imports and the first National Bank. Hamilton's plan seemed to restore faith in the government and stimulated growth in the economy.

After Washington finished his second term, John Adams was elected president of the United States in 1796. Next came Thomas Jefferson in 1800.



Thomas Jefferson
President 1801–1809

Arguments Over Land

Another problem faced the new country—what to do with the enormous lands the United States gained after winning the Revolutionary War. Everyone greedily claimed the new lands. Some areas were claimed by several states at one time. The leaders of the United States had to figure out how to fairly divide up the land.

The Land Ordinance of 1785 spelled out how to divide the new property into townships and sections. The sections were to be sold to settlers. Certain sections were set aside for the government and for public schools.

In 1787, Virginia state delegate Thomas Jefferson designed the Northwest Ordinance, which provided rules for how new states would be created in the Northwest Territory. It ensured that the United States would hold no colonies as Britain had held the 13 colonies.



Tecumseh led the Shawnees to fight against American settlers moving into the Northwest Territory where Native Americans had been living for centuries.



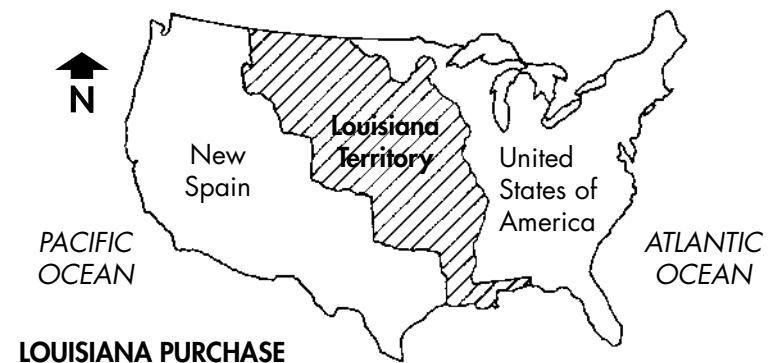
Settlers built homes, such as the one above, when they moved westward.

The Land Ordinance and the Northwest Ordinance set the stage for a huge movement of settlers westward in the early 1800s. To enable this **expansion**, roads, canals, and railroads were built. The nation was rapidly expanding, and the new government seemed able to keep up with the pace. Debts were being paid, land disagreements were settled, and a division of power for the new government was established. The outlook for the new nation had turned from the grimness that followed the war to the brightness of the future.

The Louisiana Purchase

With all this **prosperity** and expansion, leaders of the United States started making plans. France now held the land from the Mississippi River to the Rocky Mountains, and the port of New Orleans, which meant U.S. westerners could not use the Mississippi River or the port of New Orleans to move crops for trade. The United States approached Napoleon Bonaparte, France's emperor, to try to buy New Orleans.

Bonaparte had some major setbacks in a war in Europe, and he needed troops and money. In order to fund his war, he offered to sell not only New Orleans, but also the entire Louisiana Territory for \$15 million. In November 1803, the United States purchased the Louisiana Territory for France's asking price—and doubled the size of the nation. The purchase added 800,000 square miles and 200,000 people to the United States.



LOUISIANA PURCHASE

Exploration and War

In May 1804, President Thomas Jefferson sent two army officers—Meriwether Lewis and William Clark—plus a 45-member group to explore the Louisiana Territory and report back. After more than two years of traveling, the group returned with journals, drawings, and samples of wildlife, plants, and stories of the Native Americans they had met on their travels.



Lewis and Clark's group travels through the Louisiana Territory.

It seemed that the United States had a firm hold on its land in North America. However, while Lewis and Clark explored the new western territory of the United States, an old ally—France—fought a raging war with Great Britain. President Jefferson hoped to keep the United States out of the war, and when James Madison became president in 1808, he hoped to do the same.

The United States would not be able to stay out of the war, however, because British and French ships began **seizing** and searching U.S. ships in order to keep supplies from reaching their enemies. The British also seized the sailors on the ships they took, forcing them to serve as British sailors. This made U.S. citizens who had gained independence from Britain subject to Great Britain's **tyranny** again.

In 1812, President Madison told Britain to stop searching and seizing U.S. ships, or there would be war. Not satisfied with the response, Madison declared war with Britain on June 1, 1812.

The United States did not have the navy to fight Britain on the seas. An invasion to conquer British-controlled Canada failed, proving the army could not take on the giant nation again. For two

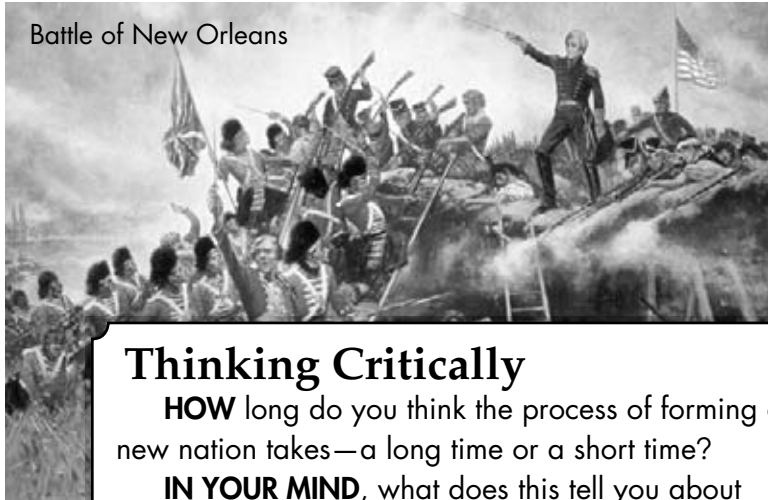


The U.S. ship *Constitution* defeats the British ship *Guerriere* on August 19, 1812.

and a half years, the United States remained at war with Britain.

On December 24, 1814, the two countries signed a peace treaty to end the war.

Battle of New Orleans



Thinking Critically

HOW long do you think the process of forming a new nation takes—a long time or a short time?

IN YOUR MIND, what does this tell you about new governments being formed today?

Even though the war had officially ended, the United States engaged in one more battle against the British. On January 8, 1815, Americans decisively won the Battle of New Orleans under General Andrew Jackson (who was unaware a peace treaty had been signed). More than 20,000 British soldiers died. The U.S. death toll was eight.

The victory at the Battle of New Orleans made it clear that the United States, not Great Britain, truly controlled the western part of the country. It also made U.S. citizens feel like they had won the War of 1812, although, in truth, neither side was victorious. Maybe the most important outcome was that the late victory made the new United States of America feel truly united as one nation.

Timeline of the American Revolution

WE, the People of the United States, in order to form

1754–63 French and Indian War

for the common defence, promote the general welfare, and

1764–65 Sugar Act, Quartering Act, and Stamp Act

United States of America.

1767 Townshend Acts

1770 Boston Massacre

1774 Coercive (Intolerable) Acts;

1775 Revolutionary War starts;

1775 Second Continental Congress meets

July 4, 1776 Declaration of Independence signed

1781 Revolutionary War ends;

1781 Articles of Confederation approved

1786 Shay's Rebellion

1787 Constitutional Convention held

1791 Constitution ratified by all states;

1791 Bill of Rights ratified

1812 War with Britain begins again

1814 Treaty of Ghent signed to end

1814 War of 1812



Glossary

appointed	to be chosen for a job (p. 5)
authority	power of government over others (p. 5)
checks and balances	a system that allows each part to limit the power of the other parts (p. 12)
compromise	an agreement reached by each side giving up something (p. 12)
constitution	basic laws of a state or nation that tell how the government is run (p. 5)
debates	discussions held between two groups who disagree (p. 11)
debts	money owed to another (p. 6)
expansion	the act of taking up more space (p. 17)
freedom	the ability to move or act without being controlled by others (p. 5)
guaranteed	to have promised (p. 13)
peace treaty	an agreement between two groups to end violence, often war (p. 7)
population	the number of people in an area (p. 11)
prosperity	enjoying success or good fortune (p. 18)
ratify	to approve through legal means (p. 13)
rebellion	an open fight against government (p. 9)

representatives	people who act for, or in place of, others (p. 7)
seizing	taking control by force (p. 20)
tyranny	harsh or cruel acts or conduct by a person or a group in power (p. 20)

Index

Adams, Abigail, 13	Lewis, Meriwether, 19
Adams, John, 13, 15	Louisiana Purchase, 18
Antifederalists, 13	Madison, James, 19, 20
Articles of Confederation, 5-7, 11, 22	Napoleon (Bonaparte), 18
Bill of Rights, 13, 22	New Orleans, Battle of, 21
checks and balances, 12	Northwest Ordinance, 16, 17
Clark, William, 19	Philadelphia, 10
Constitution, 5, 10-14, 22	representation, 11
Constitutional Convention, 10-13, 22	Second Continental Congress, 5
Federalists, 13	Shays' Rebellion, 9, 22
France, 18-20, 22	slavery, 10, 13, 15
Hamilton, Alexander, 15	Treaty of Ghent, 20, 22
Independence Hall, 10	Treaty of Paris, 7
Jackson, Andrew, 21	women, 14
Jefferson, Thomas, 15, 16	Washington, George, 10, 15
Land Ordinance of 1785, 16, 17	Yorktown, 7

Name _____

INSTRUCTIONS: In the first row, write what you already know about the events after the American Revolution. In the second row, write what you want to know about it. After you finish reading, fill in the third row with information you learned.

K: What I know

W: What I want to know

L: What I learned

Name _____

INSTRUCTIONS: In the boxes to the left, write the four main problems that the 13 colonies encountered while building a new nation. Then write the solutions to those problems in the boxes to the right.

Problem	Solution
Problem	Solution
Problem	Solution
Problem	Solution

BUILDING A NATION • LEVEL Z • 2

SKILL: PROBLEM AND SOLUTION

Name _____

INSTRUCTIONS: Read each sentence. Use information from the book *Building a Nation* to choose two words from the box that create a hyphenated compound adjective. Write the new word in the blank space to complete each sentence. Then underline the noun that each adjective describes.

late	class	free	45
fifty	debt	upper	branch
five	well	three	fifths
known	three	eighteenth	member

1. The Revolutionary War ended in the _____ late-eighteenth _____ century.
2. _____ men met for a Constitutional Convention in 1787 to change the Articles of Confederation.
3. George Washington is a _____ figure in American history.
4. The United States was not a _____ nation after the war because it owed \$76 million dollars.
5. As wealthy and educated individuals, delegates of the Constitutional Convention might be considered _____ citizens.
6. Slaves counted as _____ of the population for representation purposes.
7. Delegates developed a _____ system of government which was outlined in the constitution.
8. A _____ group was sent to explore the Louisiana Territory.

Name _____

INSTRUCTIONS: Choose a preposition from the box. Use the preposition to write a sentence that contains a prepositional phrase. The subject in each sentence is provided on the lines below.

aboard, about, above, across, after, against, along, among, around, at, before,
behind, below, beneath, beside, besides, between, beyond, but, by, down, during,
except, for, from, in, inside, into, like, near, of, off, on, out, over, past, since, through,
throughout, to, toward, under, underneath, until, up, upon, with, within, without

1. The Declaration of Independence _____

2. Delegates from the 13 colonies _____

3. The Articles of Confederation _____

4. The Peace Treaty of Paris _____

5. Money troubles _____

6. The Constitutional Convention _____

7. Checks and balances _____

8. The Louisiana Purchase _____

InFLUenza

A Reading A-Z Level Z Leveled Reader

Word Count: 1,586



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Table of Contents

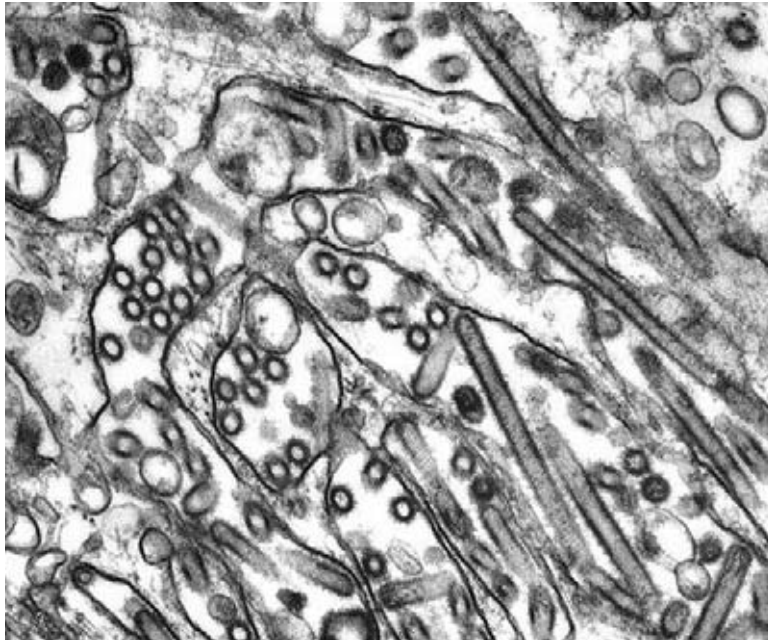
Introduction	4
What Is the Flu?	5
Changing Viruses.....	9
The Body Fights Back	11
Preventing the Virus from Taking Over	12
Treating the Flu.....	17
History of the Flu.....	18
Conclusion	22
Glossary.....	23
Index	24

Introduction

Have you ever gotten the shakes or felt really hot? Have you ever had a sore throat, a pounding headache, and muscle aches? Have you ever felt really tired and sleepy? Often, this means flu **germs** have invaded your body. By learning about the flu—what it is, what causes it, what its symptoms are, and how to treat it—you can fight back against the flu and stay healthy.



A water bottle and a blanket can help when you have the flu.



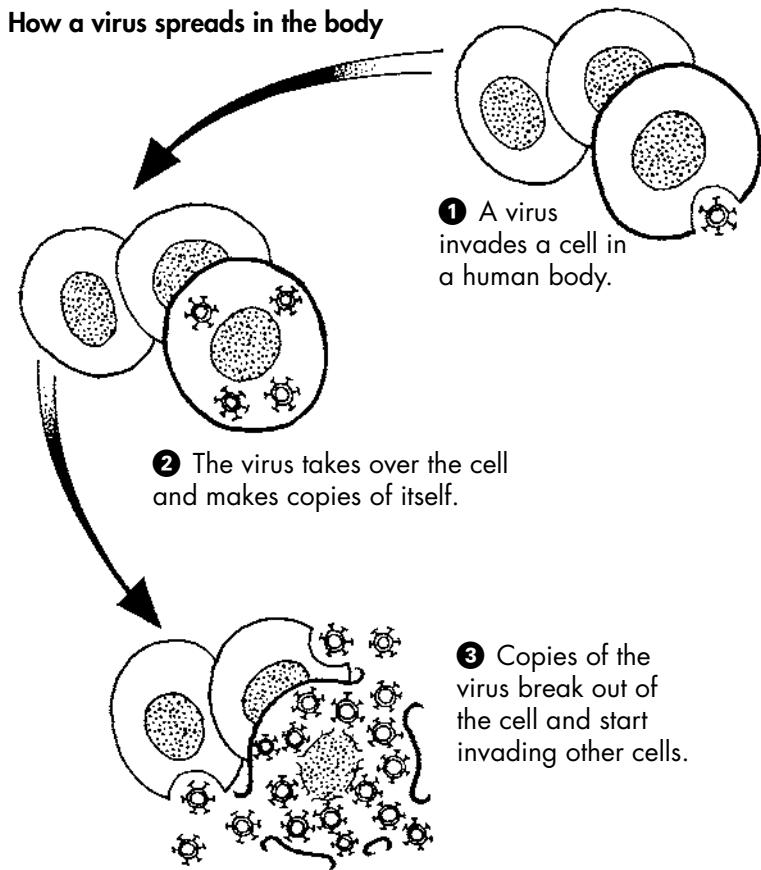
Avian influenza virus

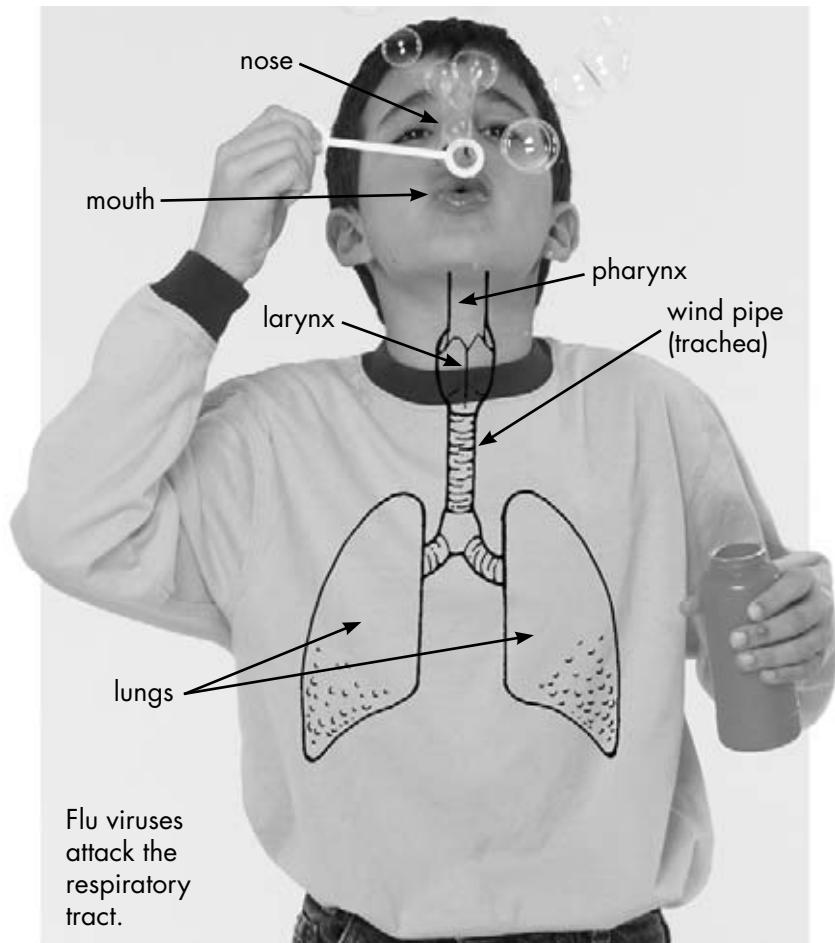
What Is the Flu?

The flu, also called **influenza** (in-floo-EN-zah), is caused by a **virus** that has the ability to spread between people faster than water rushing out of a hose. A virus is a tiny **microorganism**, called a **microbe** or a germ, which is invisible to the naked eye. Scientists use strong microscopes to see viruses and, even then, they can see a virus only after it has been magnified to a thousand times its original size. In fact, hundreds of thousands of microbes can live on the head of a pin—they are that small!

Viruses are everywhere. And during flu season, which in the United States lasts from October through May, viruses are particularly widespread. Viruses invade the cells of human beings and begin to rapidly make copies of themselves. Influenza is spread through the passing of viruses from one person to another. This is why it is always important to wash your hands or cover your mouth when you cough.

How a virus spreads in the body





There are many kinds of flu and each is caused by a specific kind of virus. But even though there are different kinds of flu, the symptoms are very similar from one kind of flu to another. Flu is an infection of the **respiratory tract**. It usually causes you to feel achy, feverish, sick to your stomach, and worn down.

There are three basic types of influenza: Influenza A, Influenza B, and Influenza C. Influenza A can cause serious illnesses in humans and animals, and it is usually responsible for large outbreaks. Influenza B is milder, causes smaller outbreaks, and affects only humans (mostly children). Influenza C usually causes only mild illness in humans.



Tiny drops of saliva and mucus fill the air when you sneeze.

All types of influenza can be passed from an infected person to a healthy person through the air or on objects such as eating and drinking utensils. It is carried in saliva from an infected person's mouth or on droplets of mucus sneezed or coughed into the air.

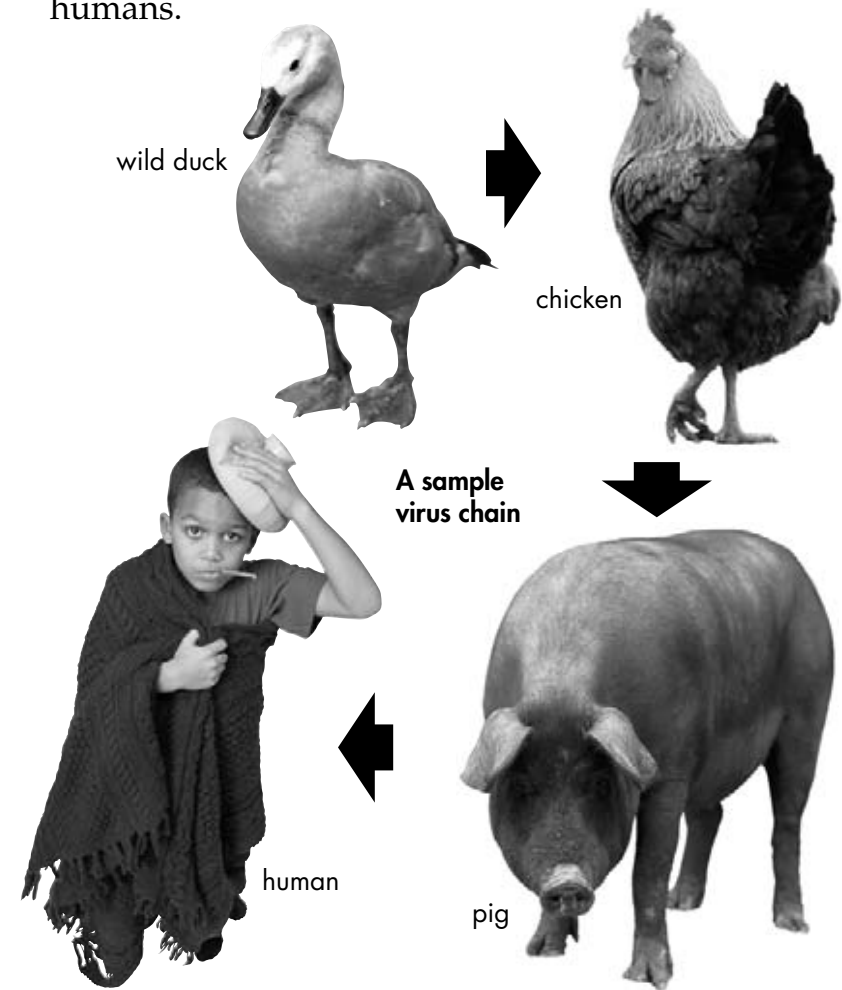


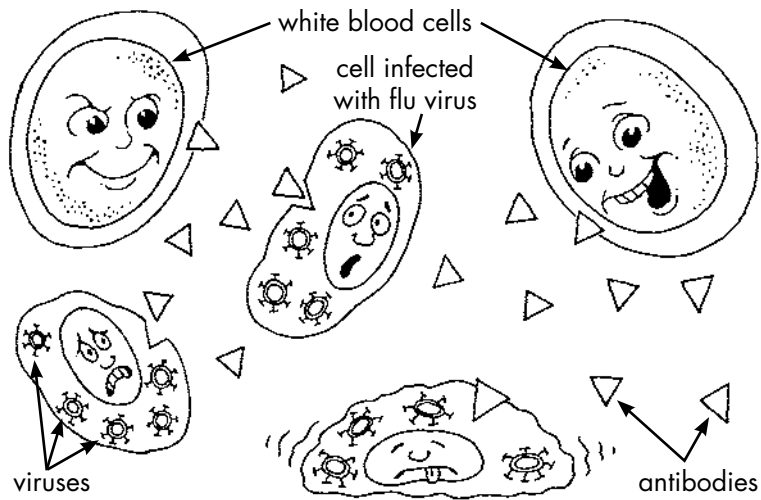
Wild birds (above) often pass viruses to farm chickens (right) that are around people more often.

Changing Viruses

Viruses are capable of changing or **mutating**. Flu viruses are among the most changeable of all viruses. Each type of virus that mutates from another virus is called a **strain** of that virus. Many influenza viruses start in wild animals, most often in birds. These viruses can easily mutate into strains that infect ducks and chickens found on farms. From there, a virus further mutates into strains that infect animals such as pigs.

Since chickens, pigs, and humans live close to each other on farms, the spread and mixing of viruses becomes a great concern. The chain of animals infected varies from virus to virus. A virus chain can include dogs and even whales. Sometimes viruses can take a shortcut—the Avian Virus of 1997 jumped directly from birds to humans.





The Body Fights Back

The human body has ways of fighting back against the invasion of flu viruses. The system of the body responsible for protecting against the invasion of harmful microbes is the immune system. The immune system produces chemicals called **antibodies** that are carried in the blood and patrol the body looking for foreign invaders. When they find one, antibodies attack and destroy cells that contain the virus.

However, if the immune system of a human body invaded by a virus is weak, viruses can get a stronghold and begin reproducing faster than antibodies are able to destroy them. When this happens, the body comes down with flu symptoms that quickly get worse without medical care.

Preventing the Virus from Taking Over

Some common sense actions can be taken to prevent a flu virus from entering your body. One of the best safeguards is to stay healthy by getting plenty of rest and eating well. It is also important to avoid contact with objects used by infected people for eating and drinking. As other important steps toward preventing the flu, you should wash your hands often and keep your fingers out of your mouth. Avoiding people who have flu symptoms, like sneezing and coughing, will also protect you from the virus.



Washing your hands often will help keep you from getting the flu.



Scientists study ways to help your body fight the flu.

But even the most cautious people can become infected. Fortunately, medical scientists have found a way to keep the flu virus from taking over your body. They have developed **vaccines**. Vaccines are weakened or dead flu viruses that are injected into a person's body. These weakened viruses cause the body to produce antibodies that attack and destroy the dead or weakened germs. Once the body has "rallied the troops" and produced antibodies to destroy the viruses injected into the body, it is on alert and prepared to attack stronger viruses that may invade during the flu season.

Each strain of virus requires a different vaccine. Sometimes flu vaccines contain several strains. When these strains are injected into the body, each one causes the body to produce a particular antibody to destroy it. In this way, the body is prepared to defend against many strains of virus that doctors think might be present during the flu season.



Vaccines for most viral strains have an 80 percent prevention rate, which means that 80 percent of the time you won't get sick from a strain you have been vaccinated against. That's pretty high, but it's not perfect, so you might still get the flu even if you've gotten a vaccine. But if you've had the vaccine, your symptoms will be milder—you won't ache so much, and you won't feel so hot.

Not everyone has the same risk of catching the flu. And some people get more seriously ill than others. People who have health conditions such as diabetes and heart disease, older people, and very young children are more at risk of catching the flu than other people.

High Risk Populations	
People over 65	
Babies and very young children	
Pregnant women	
People with diabetes	
People with heart and lung disease	
People who are sick and exhausted	
Healthcare workers	

Do You Know?

I bet you didn't know that many vaccines are made in hundreds of millions of special-grown chicken eggs! Can you imagine that many eggs? They would fill up about 50 football fields.

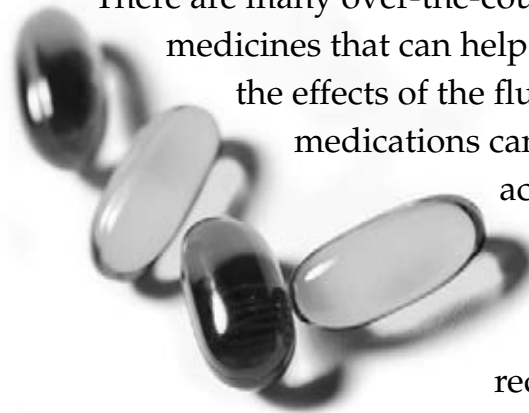
Scientists and doctors begin by separating viruses to isolate the selected virus. Then, as you might expect, they kill or weaken the virus and combine it with two other dead virus strains that have been similarly grown in chicken eggs. Then they combine the dead and weakened viruses to make a vaccine to protect you from each strain.



Treating the Flu

It is not always possible to prevent the flu. However, once viruses infect your body and take over, there are things you can do.

There are many over-the-counter medicines that can help relieve the effects of the flu. These medications can take away the achy feeling in your head and muscles. They can also help reduce a fever.



It is important to drink lots of fluid when you have the flu. Fluids can include water or fruit juices. You should also get plenty of rest so your body can better fight the viruses that have invaded your body.



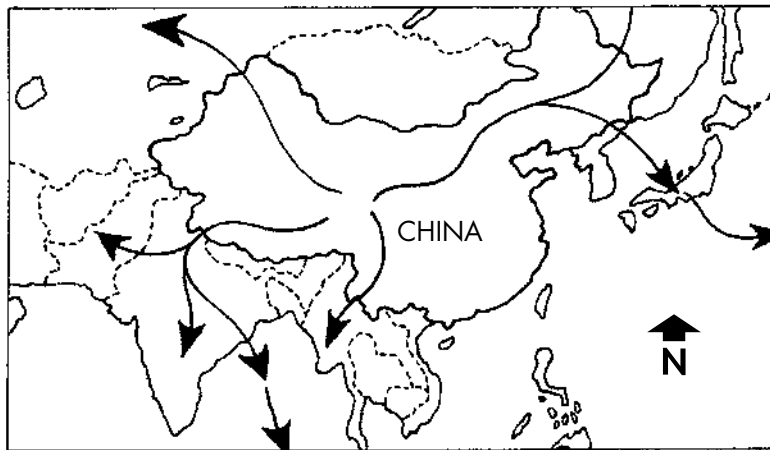
A doctor gives a child a shot of vaccine in 1941.

History of the Flu

Throughout history there have been many outbreaks of influenza. Some of them have been mild and not very widespread. Other outbreaks have been severe, spreading throughout the world and killing millions of people. Once a flu virus develops and infects a few people, it can spread rapidly and become an **epidemic**. Scientists think that there have been many flu epidemics as far back as 400 years ago and that each has killed thousands of people.

The history of any influenza outbreak begins with a single person. On the morning of March 11, 1918, a young man in the Army reported to the hospital with a fever, sore throat, and a headache. Shortly after, many other people developed the same symptoms. In one week, the Army hospital was treating more than 500 sick soldiers. By spring, 48 of those people had died. No one knew why—not even the doctors and scientists. Doctors soon learned that the illness was caused by a particular strain of influenza virus.

In total, the strain of influenza called the Spanish flu killed more than 600,000 Americans and 25 million to 40 million people worldwide. An outbreak of this size is known as a **pandemic**, or a disease that spreads rapidly around the globe.



This map shows an example of how pandemics, such as the Asian flu of 1957–'58, might spread from one area to the next.

But the pandemic of 1918 was not the only major influenza outbreak in history. The Asian flu appeared in 1957 and caused about 70,000 deaths in the United States. It got its name because it first appeared in China before coming to the United States in June 1957. Another strain of flu, the Hong Kong flu, was first detected in Hong Kong, China. In 1968, this virus caused another pandemic resulting in 34,000 deaths in just the United States. That's the size of a small city!

The following chart details three major influenza pandemics in recent history.

Historic Influenza Pandemics	
1917–1919:	The Spanish flu, the most lethal influenza pandemic ever, kills more than 20 million people.
1957–1958:	The Asian flu appears in southwest China in February 1957, then spreads throughout the Pacific. It affects 10 percent to 35 percent of the population, but kills many fewer people than the Spanish flu.
1968–1969:	The Hong Kong flu claims 700,000 lives worldwide, with 34,000 in the United States.

Other outbreaks have caused worldwide scares but have never developed into pandemics. These include the Russian flu in 1977 and the Avian flu in 1997 and 1999. Both of these strains of flu began in regions of China and spread to other countries. Doctors are always on the lookout for the next major outbreak. They believe that if they can detect it early, they can keep it from becoming a worldwide pandemic.



Masks that fit around the nose and mouth are sometimes worn to help prevent the spread of viruses. However, the masks do not work all the time.

Conclusion

Influenza has been around for hundreds of years. Because flu viruses can change and develop into new strains, influenza may never be wiped out. When you have the flu, the most important thing you want to do is take care of yourself and prevent others from getting it. That means, no matter how mad you are at your sister or brother, you don't want to cough on her or his arm! You'll want to drink as much water as a camel and sleep like a bear. Get a vaccine if one is available. Most importantly, remember to attack back! Good food and rest allows the healthy cells in your body win the battle.



Glossary

antibodies	chemicals produced by the body that attack invading germs (p. 11)
epidemic	an outbreak of disease that spreads rapidly through a group of people (p. 18)
germs	tiny microorganisms that often cause disease and sickness (p. 4)
influenza (flu)	an infection of the respiratory tract caused by viruses and can spread rapidly in people and animals (p. 5)
microbe	(see microorganism)
micro-organism	an organism of microscopic size, such as a virus or single bacteria cell (p. 5)
mutating	changing (p. 9)
pandemic	when a disease infects many people around the world (p. 19)
respiratory tract	the air passages from the nose to the throat (p. 7)
strain	a group of viral organisms having the same species (p. 9)
vaccines	a medicine made of weak or dead viral strains that teaches the body to fight stronger viruses of the same type (p. 13)
virus	tiny microorganisms that enter the body, get into cells, rapidly reproduce, and cause illness (p. 5)

Index

antibodies, 11, 13, 14	outbreaks, 9, 19–21
Asian flu, 20	pandemic, 19–21
Avian flu, 5, 10, 21	passed (or spread), 6, 8–10, 18–21
birds, 9, 10	pigs, 9, 10
China, 20, 21	prevention, 12, 17, 21, 22
chicken, 9, 10, 16	respiratory tract, 7
eggs, 16	risk, 14, 15
epidemic, 18	Russian flu, 21
flu season, 6, 8, 13, 14	saliva, 8
germs, 4, 13	Spanish flu, 20
Hong Kong flu, 20	strain, 9, 14, 16, 19–21
immune system, 11	symptoms, 4, 7, 11, 12, 14, 17
medications, 17	types of influenza, 7–9
microbe, 5, 11	United States, 6, 20
microorganism, 5	vaccines, 13, 14, 16
microscopes, 5	virus chain, 10
mucus, 8	
mutating, 9	

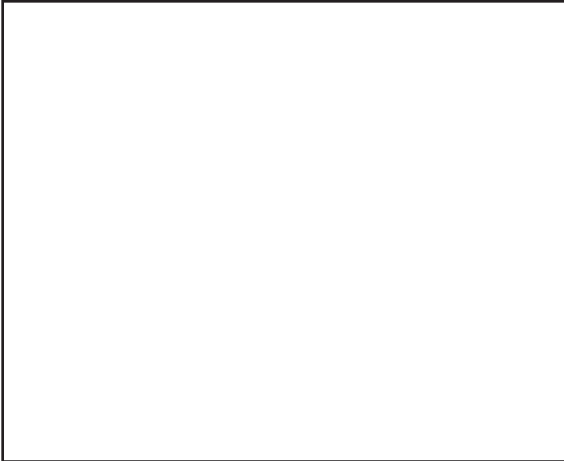
Explore More

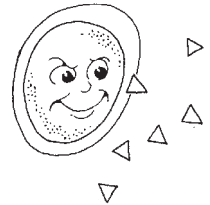
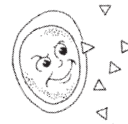
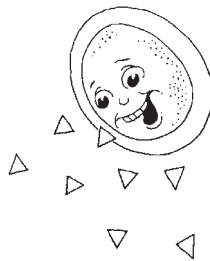
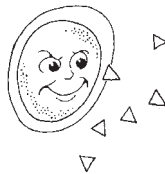
On the Internet, use www.google.com to find out more about topics presented in this book. Use terms from the text, or try searching for glossary or index words. Here are some searches you can try: *influenza*, *flu pandemic*, or *flu vaccine*.

Name _____

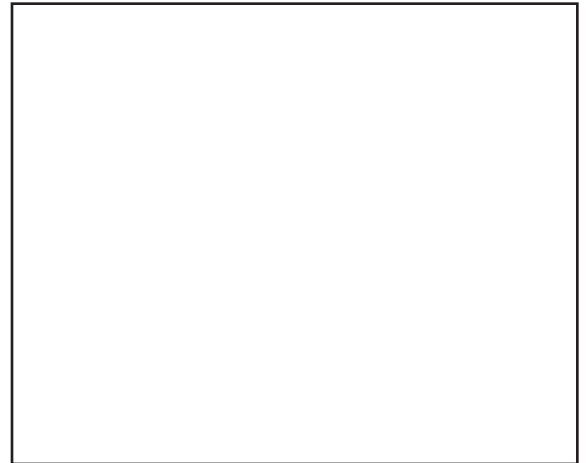
INSTRUCTIONS: Draw your understanding of the influenza virus in each of the boxes, including: the respiratory tract, how viruses invade cells, and how antibodies attack viruses. Then write an explanation of each drawing on the lines below each box, using the vocabulary words *virus*, *respiratory tract*, and *antibodies* where appropriate.

Respiratory Tract



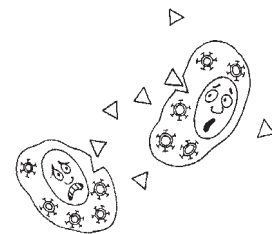
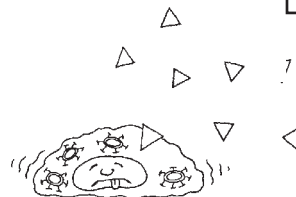


Virus Invades





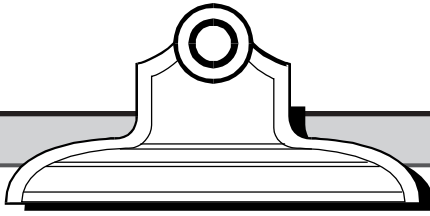
Antibodies



Name _____

INSTRUCTIONS: Write up to four of the main ideas from the book in the left-hand boxes. In the right-hand boxes, list up to three details that support each main idea.

Main Idea	Details
Main Idea	Details
Main Idea	Details
Main Idea	Details



Name _____

INSTRUCTIONS: Read each sentence. Choose a word from the box that completes each sentence by changing the word into an adverb. Write the new word on the line in each sentence and circle the verb each adverb describes.

quick	loud	immediate	eager
careful	sudden	periodical	clever

1. A virus can _____ quickly _____ spread inside the body.
2. The person next to me coughed _____ .
3. When the fire alarm rang, the people _____ exited the building.
4. The student _____ volunteered to help teach others about healthy habits.
5. The students _____ flossed to get rid of the food between their teeth.
6. The student _____ covered her mouth and sneezed.
7. The students _____ washed their hands, especially before meals.
8. Medical scientists _____ developed vaccines to try to keep the flu virus from infecting your body.

Write two sentences using adverbs, circling the verb the adverb describes in each sentence.

1. _____

2. _____

M Is for Mexico

A Reading A-Z Level Z Leveled Reader

Word Count: 2,193



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M Is for Mexico

Great tales from Mexico

A Mayan pyramid
rises from the
tropical forest
at Uxmal

MEXICO

Come on in, the water's fine

MEXICO

Written by Amy Weber

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M Is for Mexico



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Fountas & Pinnell	V
Reading Recovery	29
DRA	N/A



Mariachi Copper Sculpture

Table of Contents

My Travel Brochure	4
The Land	5
When to Visit	9
My Country's History	10
Mexico City	11
Central and Southern Mexico	14
The Gulf Coast and Yucatán Peninsula	17
Northern Mexico	20
Quick Facts About Mexico	23
Glossary	24



A mariachi band

My Travel Brochure

By Juan Rodriguez

Ms. Brown's Fifth Grade Class

Welcome to Mexico! I am so glad you have come to visit my beautiful country. Mexico has a lot of rich history and culture. The people who live here are very kind, and their hospitality is out of this world!

There is so much here to see and do. The question is not what you want to do, but whether you will have the time to do it all. You might want to relax on the shores of Mexico's many beaches or visit some of our wonderful museums, historic sites, or ancient **ruins**. You could even go for a horseback ride in the mountains, a boat ride through the wetlands, or listen to local **mariachi** music. Whatever you want to do or see, Mexico has something for you!



The Land



Let's begin our tour by learning a little bit about Mexico's **geography**. Mexico is located at the southern part of North America. The United States is its neighbor to the north. Guatemala and Belize are its neighbors to the south. The country is divided into North and South, just like the Americas. In southern Mexico, most states have large rural areas with a large farming population. The northern states are wealthier than the southern states and are mostly urban and industrialized.

More than half of the country's population lives in the central part of the country. This area is what is called the Valley of Mexico. Mexico City, Mexico's capital, is in the valley. It is one of the ten largest cities in the world! About 18,131,000 people live in the Mexico City area while about 106 million people live in the entire country of Mexico.

Five of the World's Top 10 (Population within city limits)*

Mumbai (Bombay), India	11,914,398
São Paulo, Brazil	10,927,985
Moscow, Russia	10,101,500
Istanbul, Turkey	8,831,805
Mexico City, Mexico	8,591,309

*Source: GeoHive, from most recent actual or estimated figures

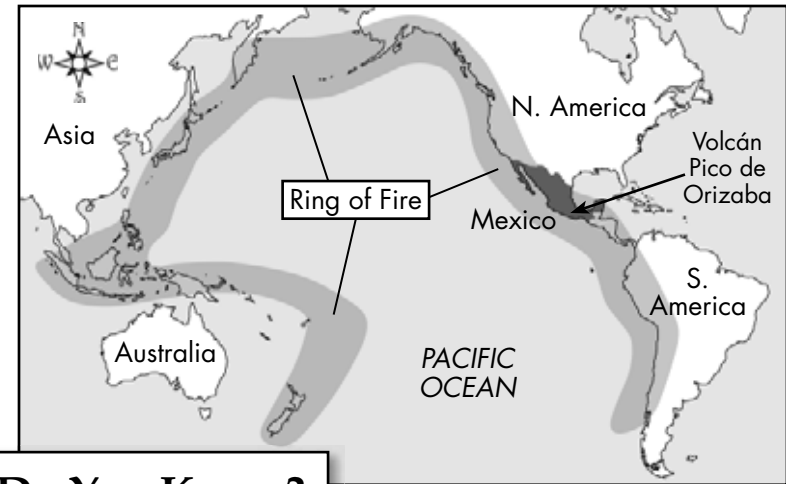
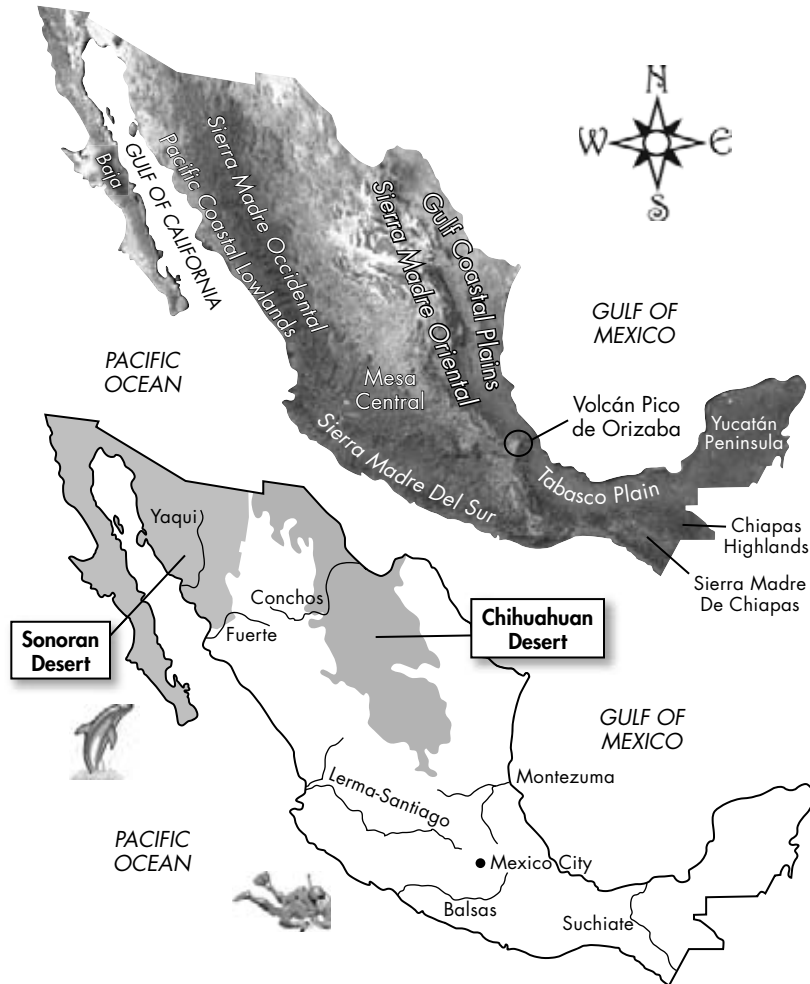
Mexico's States



The land in Mexico covers 756,066 square miles. How big is that? Well, you could fit about five countries the size of Mexico into the United States. I bet you didn't know that Mexico has states, too. It has 31 states and a federal district. All of these areas have totally cool places to visit! Mexico's blue water and landforms are as diverse as its people and culture.



Mexico's many unique **landform** regions include the Mexican plateau, the central plateau, Gulf Coastal Plain, Pacific Coastal Lowlands, southern highlands, *Chiapas Highlands*, Tabasco Plain, the *Yucatán Peninsula*, *Sierra Madre Occidental* and *Sierra Madre Oriental*, and the Sonoran Desert. If you review that list, you'll notice that very few sound alike.



Do You Know?

Volcán Pico de Orizaba has not erupted since 1687. No one climbed it until 1848. The volcano is the third highest in North America. Do you know what the first two highest points are?

Since Mexico is a diverse land, it ranks third in the world for the most varied plant and animal species. Did you know that Mexico is also in the "Ring of Fire"? That means that it is located

in an area where volcanoes in the Pacific Ocean are very active. I hope you will take the time to visit Mexico's *Volcán Pico de Orizaba*. This is a fascinating **dormant** volcano and the country's highest point. It rises to 18,406 feet (5,610 meters).



From cities to rural areas, from deserts to rainforests, from wetlands to canyons, Mexico has every kind of environment you're looking for! Let's explore more about my country.

When to Visit

One thing to keep in mind is that Mexico's climate along the coast is hot and humid. If you don't like hot and humid weather, you should plan your trip from October through May. Of course, the temperatures are almost always milder inland and in the mountains. If you love dry weather, try visiting *Baja California* or the Sonoran or *Chihuahuan* deserts. It is dry in these places year-round.



Cacti in the Sonoran desert
in Baja California

Boys snorkel off
Baja California

My Country's History

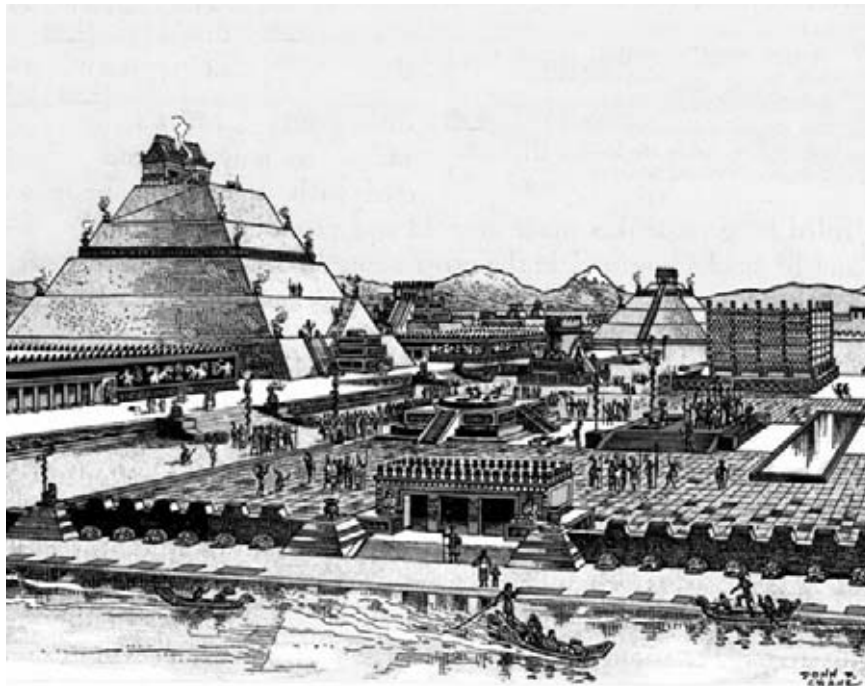
Before the Spanish defeated the Aztecs in 1521, Mexico was part of what is called Mesoamerica. The Olmecs, Maya, *Teotihuacán*, Toltec, and the Aztec peoples lived in Mesoamerica for a long time before the Spanish arrived. This period of history is called the pre-Columbian period. You can visit some of the buildings they left behind such as temples, pyramids, and even ball courts!

The Aztecs were the most powerful of the pre-Columbian **civilizations**. After the Spanish arrived and **conquered** the Aztecs, not only did the people change, but also our land. Spain sent some of its people to live here. The Spaniards made the **indigenous** people become Catholics. They had to learn Spanish and Latin, and many of the native languages disappeared. Today Spanish is the official language of Mexico. Mexico was a **colony** of Spain until 1810. Many Mexicans revolted against Spain, and in 1821, Mexico officially won its independence. It is now a **republic**.



Explore More

In addition to the Aztecs, the Olmecs, Maya, *Teotihuacán*, and Toltecs also lived in Mesoamerica. Find out more about these cultures and civilizations by searching the Internet or your local library.



Templo Mayor in Tenochtitlán, capital of the Aztec Empire

Mexico City

Now, let's begin our tour of some of the great cities to visit. We'll begin in the heart of Mexico—Mexico City. When the Aztecs ruled, it was called *Tenochtitlán*. Many of the ancient ruins in and around Mexico City were built by the Aztecs. The *Templo Mayor* (Great Temple) was actually the site of the capital of the Aztec **Empire**. It was built during the 1300s and 1400s. The Spanish tried to bury it, but in 1978 the amazing temple's ruins were uncovered. It is now a museum.

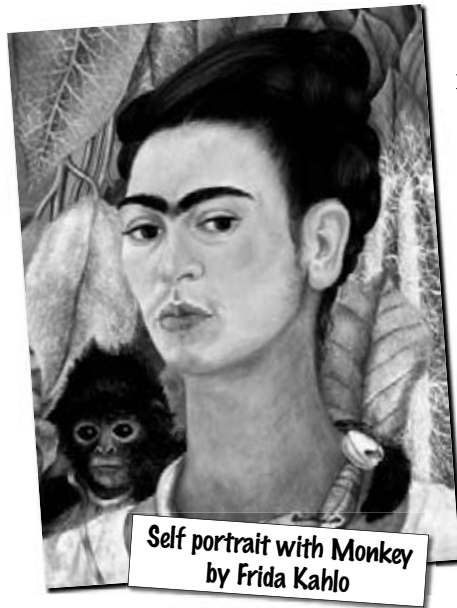
In Mexico City, there are also many beautiful things to see that were built under Spanish rule. **Cathedrals** and other examples of Spanish architecture are all over Mexico City. The largest cathedral in Latin America is *Catedral Metropolitana*. Would you believe it took nearly 300 years to build?

Throughout the city you can see painted or sculpted art by famous Mexican artists. One of the most well-known is muralist Diego Rivera. From 1929 to 1935, he painted **murals** showing Mexican history in the courtyard of the *Palacio Nacional*, or National Palace.



The site of the palace has been home to many rulers. Moctezuma, who was an Aztec emperor, lived on the same site before the Spanish conquest. After the Spanish conquest, it was home to Spanish **conquistador** Hernán Cortés. Today, the offices of Mexico's president are inside. The palace faces the *Plaza de la Constitución* (*Zócalo*). This is one of the world's largest public squares.

Mexico City's largest park is another major attraction. This was where the Aztecs used to spend their summer vacations! You can spend a part of your vacation at *Bosque de Chapultepec*, too. You can visit a zoo or botanical garden, buy a balloon or a snack, and then visit museums or art galleries and not even leave the park!



Self portrait with Monkey
by Frida Kahlo

There are other art museums and centers throughout the city, including the *Palacio de Bellas Artes*, *Museo Dolores Olmedo Patiño*, *Museo Mural Diego Rivera*, *Museo Frida Kahlo*, and many, many more. Frida Kahlo was one of the first successful female painters in

the world. She was married to Diego Rivera. My favorite painting of hers has a monkey in it!

However, if shopping is what you want to do while in Mexico City, you won't be disappointed at the *Bazar del Sábado* (Saturday Market) in the *Plaza San Jacinto* in the *San Ángel* neighborhood. You can buy Mexican fruits, vegetables, or even candy, at the *Mercado de la Merced*.



Candy at the Saturday Market

Central and Southern Mexico

Just northwest of Mexico City, you can find more great examples of Spanish colonial architecture. Sometimes this area is called the

Colonial Heartland.

It is also the heart of Mexico's rich agriculture. The Spanish built many cities and towns here because of the silver deposits. If you visit the city of *Taxco*, southwest of Mexico City, you can find many beautiful silver shops.



Spanish colonial architecture

Farther west there are many beaches.

One place known for its beaches is *Acapulco*.

Decades ago, *Puerto Vallarta* became a popular beach resort for Hollywood stars.

If you get tired of the beach, you can visit a pre-Columbian site in *Colima*. Colima has been rebuilt over and over again because frequent earthquakes continually damage it.

Guadalajara is the country's second largest city after Mexico City. There are many great places to visit in *Guadalajara*.



The cathedral at Guadalajara

There is the city's famous Cathedral, which took more than two **centuries** to build. You can take a short walk from the Cathedral and see a lot of Spanish colonial architecture.

But like many regions in Mexico, you can also just enjoy being outside! The country's largest lake, *Laguna de Chapala*, is a great place to go boating. You may want to check out the waterfalls, tropics, and mountains at *Huasteca Potosina*. I recommend that you take a boat ride to see *Tamul* waterfall. It drops 344 feet into a canyon!



Fishermen at Laguna Chapala, Mexico

Central and southern Mexico have many ancient ruins of pre-Columbian civilizations.



Pyramid of the Sun at Teotihuacán

Teotihuacán (tay-uh-tee-wah-KAHN) is probably one of the greatest examples of all pre-Columbian cities. It has two great ancient temples: the Pyramids of the Sun and the Moon, which

people visit more than any other pre-Columbian site.

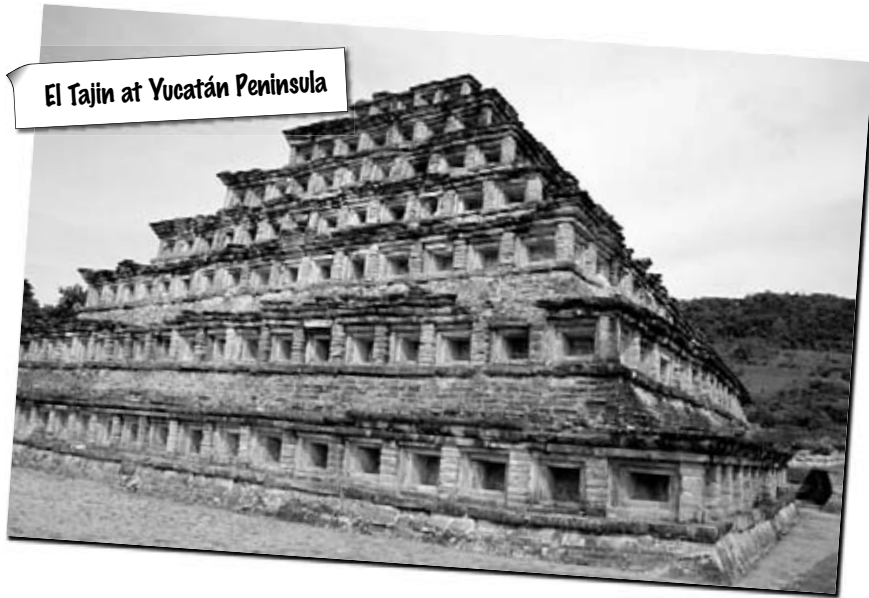
So what was *Teotihuacán*? It was once a place where about 125,000 people lived in about A.D. 400. And it is also the name of the people who lived there. Kind of confusing, huh? At that time, it was one of the world's largest cities.

Monte Albán in the state of *Oaxaca* was a city of the Zapotec people. You can visit what was their ceremonial site on top of a mountain! At one time, this was also a cultural center for the Olmec and the *Teotihuacán*.



Pyramid of the Moon at Teotihuacán

El Tajin at Yucatán Peninsula



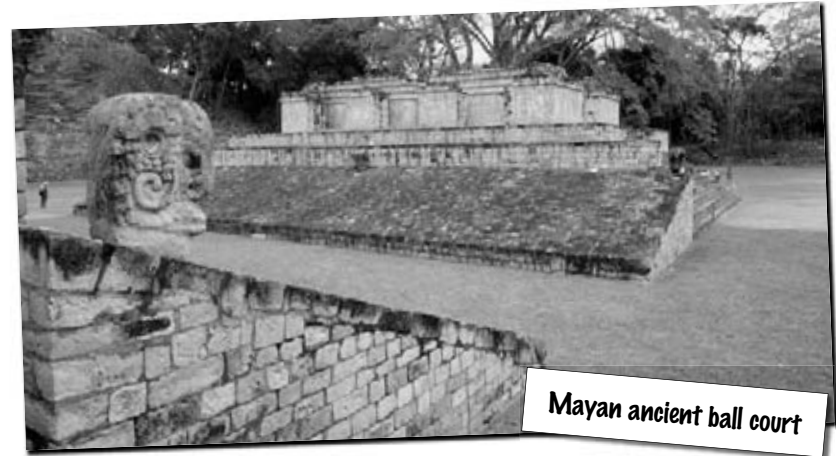
The Gulf Coast and Yucatán Peninsula

Moving out to the tropical plains and jungle of the Gulf Coast, we find land that was once home to several pre-Columbian cultures, including the Maya, Olmec, and Totonac. Olmec artifacts are all over this region, especially in the *Parque-Museo de La Venta*.



Mayan hieroglyphics

You can visit ancient pyramids at *El Tajin*. This was a major religious center for the Totonac who lived here between A.D. 900 and 1150. Or you can check out *Quiahuiztlán*, a hilltop city where some 15,000 Totonac people once lived.



Mayan ancient ball court

The Mayan ruins at *Chichen Itza* are the best preserved of anything the Maya left behind. There are temples, Mexico's largest ancient ball court, and an observatory. The Maya were fascinated with looking at the stars, just like me! They even had their own writing system. *Uxmal* is another Mayan site that you should visit. Most of the Spanish cities and towns in the *Yucatán* were actually built on top of Mayan ruins.

What other cool things are there to see and do on the Gulf Coast? Just about everything! There are many museums, cathedrals, and churches. Don't forget to stop in the city of *El Puerto Veracruz*! The waterfront promenade and arcades are a lot of fun.



coffee beans

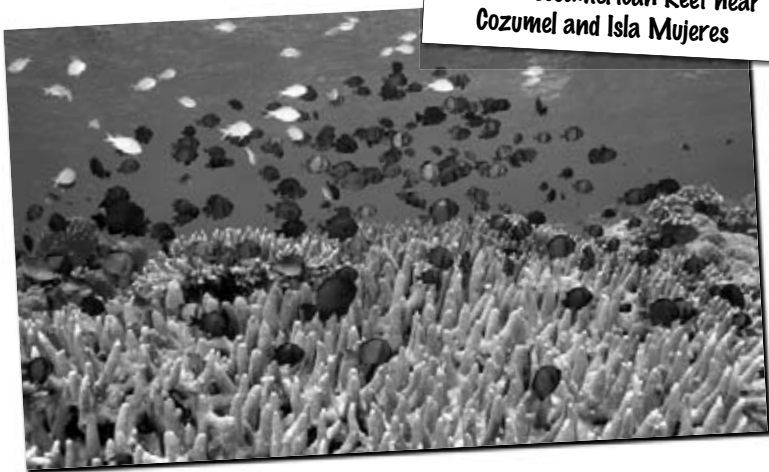
Like the Colonial Heartland, this region is also a center for agriculture. Sugarcane, cocoa (yum!), and coffee are grown here.

The *Yucatán* Peninsula is also well known for its white sand beaches, and has plenty of them considering it's surrounded by water on three sides, like *Baja California*. The world's second longest barrier reef (after Australia's) is located near the islands of *Cozumel* and *Isla Mujeres*. It is a popular place to snorkel and scuba dive. *Cancún* is probably the most popular spot to get a suntan. This region is well-known for its breathtaking natural wells called *cenotes*. Probably the most visited one is the *Cenote de Dzitnup* near *Valladolid*. Can you believe that it was discovered only a half century ago?

Scuba lessons



Great Mesoamerican Reef near Cozumel and Isla Mujeres



Copper Canyon in Northern Mexico

Northern Mexico

Many of Mexico's deserts, mountains, and canyons are located here. You might have heard of the Grand Canyon in the United States, but did you know that Copper Canyon is even bigger? It is more than one mile deep and part of the *Sierra Madre Occidental* range. You can take a train to get a close-up view of this deep canyon, its waterfalls, and lakes. The indigenous people who live there are famous for the drums and violins they make.

If you are looking for great beaches and resorts, like *Cabo San Lucas*, then *Baja California* is the place for you. It is a peninsula, so water is around three of its sides. In the winter, you can even spot whales swimming along the shore as they migrate south!



Cabo San Lucas in Baja California

You won't find any Aztec ruins in *Baja*. Why? Because the Aztecs did not live here! But you can find some ancient cave paintings. Many believe



Cave paintings at Baja California

the ancestors of the *Cochimi* painted the cave pictures. They show people and animals in black and red.

Probably the most amazing ancient ruins in this region are the adobe buildings at *Paquimé*. Adobe is a brick made with mud and grass. Often many bricks were used to create buildings that look like today's apartment buildings. Between the 900s and 1300s, more than 3,000 people lived in adobe buildings near the *Casas Grandes* river. No one really knows what happened to the people who lived there.



Ancient ruins at Paquimé



A whale dives showing its tail in the Sea of Cortez.

If you're not interested in ruins or the beach, you may enjoy whale watching in a boat. In *Guerrero Negro*, blue whales are often spotted along the *Sea of Cortés*. If you get seasick, you can visit them and many other sea mammals on land at the nearby *Laguna San Ignacio, Bahía de Magdalena*.

There are also many old Spanish missions in this region. One you can visit is called San Ignacio. It is a mission church from the 1700s. The *Museo*



The Museo de las Misiones

de las Misiones is part of *Misión Nuestra Señora de Loreto*. The Spanish built the missions in an effort to convert the indigenous people to Catholicism.

I think you have to agree with me: Mexico has much to offer you—so come visit!

Quick Facts About Mexico

People

Ethnic groups:	mestizo/Amerindian (90%), white (9%), other (1%)
Religion:	Roman Catholic (89%), Protestant (6%), other (5%)
Languages:	Spanish, Mayan, Nahuatl, other

Government

Chief of State:	President Vicente Fox (since 2000)
Congress:	Senate: 128 seats; Chamber of Deputies: 500 seats

Economics

Currency:	peso
Natural resources:	petroleum, silver, copper, gold, lead, zinc, natural gas, timber
Workforce:	agriculture (4%), industry (27.2%), services (68.9%)
Farm products:	corn, wheat, soybeans, rice, beans, cotton, coffee, fruit, tomatoes; beef, poultry, dairy products; wood products
Industries:	food and beverages, tobacco, chemicals, iron and steel, oil, mining, tourism
Exports:	manufactured goods, oil, silver, fruits and vegetables, coffee, cotton

[Source: 2005 CIA World Fact Book, Encyclopaedia Britannica]

Glossary

cathedrals	large churches (p. 12)
centuries	periods of time made up of a hundred years (p. 15)
civilizations	organized and developed societies (p. 10)
colony	an area or a country that is ruled by another country (p. 10)
conquered	to have attacked another country or group and won control of the land (p. 10)
conquistador	a Spanish conqueror (p. 12)
dormant	not active (p. 8)
empire	an area or number of countries that is controlled by one ruler (emperor) (p. 11)
geography	the study of landforms and territories (p. 5)
indigenous	native to the area (p. 10)
landform	a physical feature, such as a mountain, on Earth's surface (p. 7)
mariachi	traditional Mexican music dating back to the 1800s (p. 4)
murals	paintings on walls (p. 12)
republic	a country in which the government includes a president and elected representatives (p. 10)
ruins	what is left behind after something has been destroyed or damaged (p. 4)

Reading a-z

Main Idea	Details

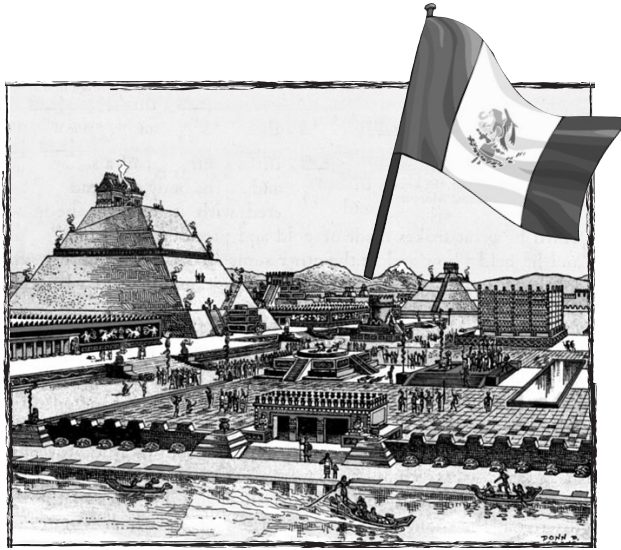


M IS FOR MEXICO • LEVEL Z • 1

SKILL: MAIN IDEA AND DETAILS/SUMMARY

Name _____

Instructions: Read each sentence below and circle the indefinite pronoun. Next, underline the noun that each pronoun is referring to in the sentence.



1. You may want to visit some of our wonderful museums, or historic sites.
2. It is one of the ten largest cities in the world!
3. Teotihuacan is one of the pre-Columbian cities.
4. Spain sent some of its people to live here.
5. Let's begin our tour of some of the great cities to visit.
6. Many of the ancient ruins in and around Mexico City were built by the Aztecs.
7. This is one of the world's largest public squares.
8. One of the places known for its beaches is Acapulco.
9. Some of the ancient cave paintings can be found here.
10. Many of the old Spanish missions are in this region.

Name _____

Instructions: Define each base word using a dictionary. Then fill in the blank in each sentence by adding the -est suffix to a base word. Use the definitions of the base words and context clues to choose the correct word for each blank.

clean _____

deep _____

easy _____

long _____

mean _____

tight _____



1. The Mariana Trench is the _____ part of the ocean.
2. I tried on the _____ pair of shoes.
3. Because I studied, this test was the _____ I've ever taken.
4. The Nile River in Egypt is the _____ river in the world.
5. After raking the leaves, we had the _____ yard.
6. My dog has the _____ growl.

Energy Sources: The Pros and Cons

A Reading A-Z Level Z Leveled Reader

Word Count: 1,803



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Energy Sources: The Pros and Cons



Written by David L. Dreier

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Energy Sources: The Pros and Cons



Written by David L. Dreier
Illustrations by Cende Hill

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Correlation

LEVEL Z	
Fountas & Pinnell	V
Reading Recovery	29
DRA	N/A



Table of Contents

The Endless Need for Energy.....	4
Fossil Fuels	6
Hydroelectric Power	10
Solar Energy	14
Nuclear Power	18
Looking to the Future	20
Glossary.....	24
Index	24

The Endless Need for Energy

The United States is a modern society. Like all modern societies, it uses a lot of **energy**. Scientists define energy as the ability to do work.

Many kinds of things can be called work. Getting an automobile to move down a road or



Machines in this car factory need energy to build cars.

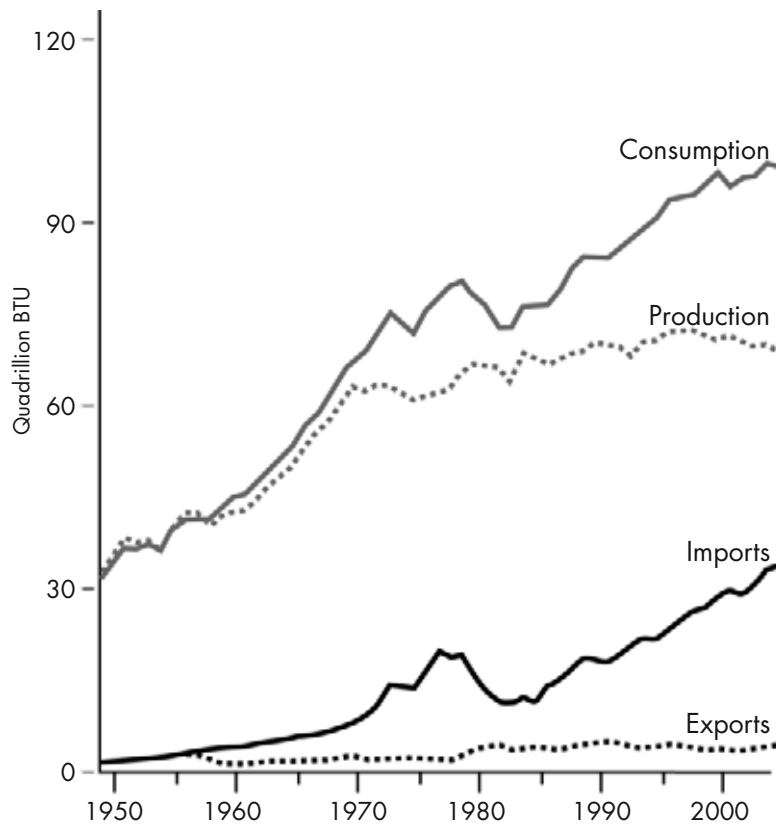
an airplane to fly is work, and so is producing electricity or running the machinery in a factory.

The energy used by the United States and other modern societies comes from many sources. Much of it comes from

the burning of fuels, such as coal and gasoline. Other energy comes from the power of flowing water, from the light of the sun, or from the splitting of atoms.

All energy sources have their pros and cons—their good points and bad points. Modern societies have to make many decisions about how best to produce energy. The needs of the society have to be balanced against the need to protect the environment. These choices are not always easy to make.

Energy use in the United States, 1949–2005



SOURCE: U.S. Energy Information Administration, Annual Energy Review 2005

Fossil Fuels

Fossil fuels—coal, oil, and natural gas—are a leading energy source around the world. They are called fossil fuels because they were formed from the remains of plants and animals that died many millions of years ago. Over time, great heat and pressure underground changed the remains into materials we use as fuel.

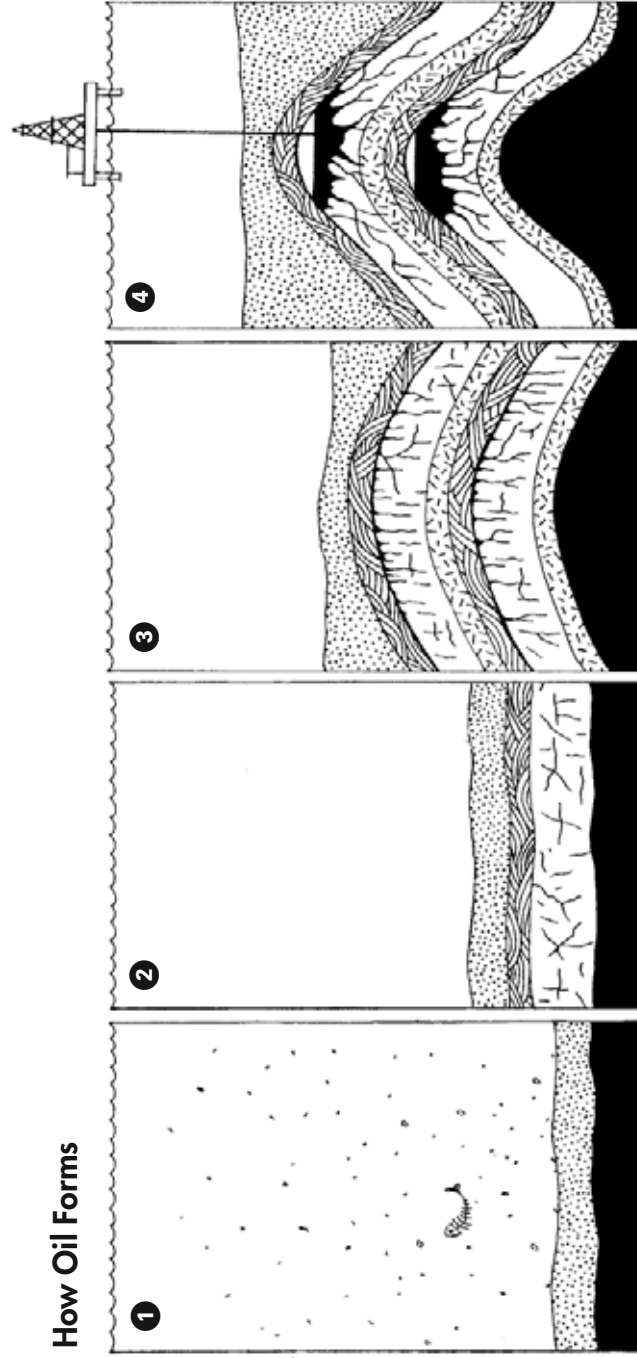


Gasoline is a common fossil fuel.

power for stoves and water heaters.

About 85 percent of energy used each year in the United States comes from fossil fuels. Coal is burned in many power plants to produce electricity. Fuels made from oil—such as gasoline, diesel fuel, and jet fuel—power our cars, trucks, and airplanes. Most homes use natural gas to provide

How Oil Forms

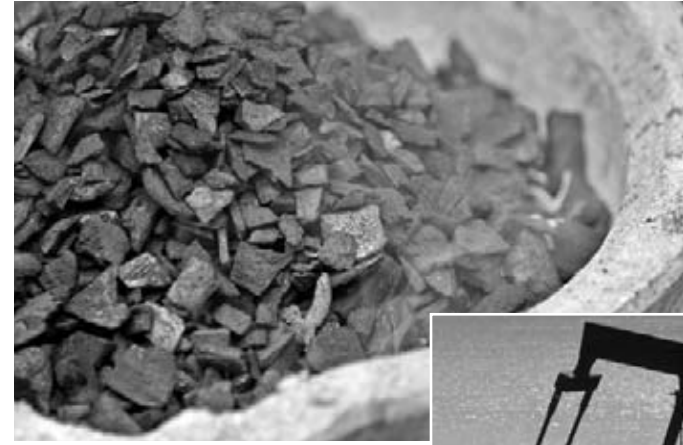


Marine plants and animals die and sink to the ocean floor. They mix with dirt and sand to form a sediment layer.

Time passes, more layers are added, pressure builds, and the buried plant and animal material changes to kerogen while the sediment forms into sedimentary rock.

More time, more layers, and more pressure change the kerogen into oil, which begins to rise through tiny holes in the sedimentary rock.

Oil rises until it hits rock it can't pass through. Oil rigs drill through this rock to pump out the collected oil.



A close-up of coal

A pump jack is used for extracting petroleum from an oil well.



One of the main advantages of fossil fuels is that they are abundant—found in many places and in large amounts. In addition, they contain a lot of usable energy. Coal is especially abundant. The United States has enough coal to last another 200 to 300 years.

A special advantage of natural gas is that it burns very cleanly. When natural gas burns, it produces mostly carbon dioxide and water vapor.

Oil's main advantage is that it burns efficiently—meaning that little is wasted in the change to energy. Also, the refining process that produces gasoline and diesel fuel produces other petroleum products used in crayons, bubble gum, eyeglasses, and even artificial heart valves.



All fossil fuels are essentially non renewable energy sources because nature cannot create enough to keep up with demand. Many experts think that the world's oil wells will be empty in a few decades. But, even before then, the oil supply will be too small to meet global demands.

Also, fossil fuels (except for natural gas) produce **pollutants**. Cars, factories, and many power plants release harmful chemicals into the air. Since fossil fuels are burned, air pollution will continue to be a problem.

Another problem is called the greenhouse effect. Gases from burning fossil fuels



Pollutants rise into the atmosphere.

may be trapping more heat in Earth's atmosphere than would be trapped naturally. This heating up of Earth's atmosphere is called **global warming**. Scientists think carbon dioxide contributes most to worsening the greenhouse effect, so even natural gas adds to the problem.

Hydroelectric Power

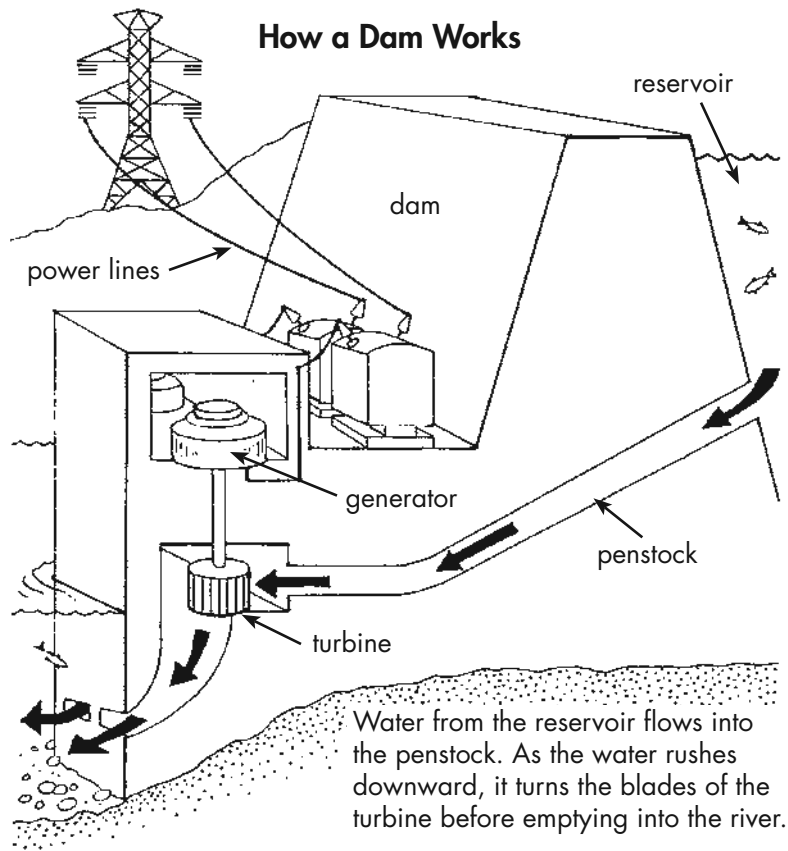
Water is widely used to produce electricity. You might wonder how electricity can be produced using water. The answer is by building dams. A dam is a huge, wide wall, usually made of concrete. It is built across a river to hold back the river's flow. The river's water then fills up a large area behind the dam, forming a lake or reservoir.

Water from the lake is released through the bottom of the dam. The water moves very fast. It passes through big machines called **turbines**. Fan-like blades inside the turbines spin when water rushes through them. The turbines are connected to other machines, called generators, making them spin too.

Inside a generator, a shaft is surrounded by giant magnets. All around the shaft and magnets is a huge coil of wire. When the turbines spin the shafts and magnets of the generators, they move electrons in the coil of wire. The movement of these electrons creates an electric current. Electricity made at dams is called **hydroelectric** power. *Hydro* is a prefix (first part of a word) that means *water*.



Generators inside a dam



Dams produce a great deal of needed electricity. There are more than 2,000 hydroelectric dams in the United States. They produce about



Hoover Dam blocks the Colorado River, creating Lake Mead, one of the world's largest artificial lakes.

10 percent of the nation's electricity. Hydroelectric dams produce about 20 percent of the world's electricity.

Dams have many other uses too. They prevent flooding by storing the water from heavy rain and snowmelt, and gradually releasing it later.

Dams also create many opportunities for recreation, such as boating and fishing in the lakes they create. In addition, the lakes provide water for homes and industries as well as provide water for farmers to irrigate their crops during drier times of the year.

Lake Mead's boat docks



Flood prevention is good for people, but not so good for the environment. Rivers are supposed to flood. Flooding produces **sediment**, which is a mixture of gravel, sand, and topsoil. Sediment deposited by floods keeps the soil rich in farmlands located near rivers. When a river is dammed, it cannot renew the soil on the land around it.



Salmon swimming upstream

Dams also block the route for fish that swim up and down rivers. In the U.S. Pacific Northwest, dams have been a serious problem for salmon. Every three to five years, salmon swim from the ocean up rivers to their birthplaces to lay eggs. Dams make it difficult for salmon to swim up and down rivers. As a result, salmon populations have severely declined in the past 100 years.

Solar Energy

Sunlight carries huge amounts of energy. You can feel the sun's energy when sunlight warms your skin on a summer day. To capture the sun's energy, scientists have developed solar cells, called photovoltaic (FOE-toe-vole-TAY-ik) cells. These cells convert sunlight into electricity.

When sunlight hits a solar cell, the cell absorbs some of the light energy. Particles in the solar cell move faster, and the movement of these particles

creates electricity.

In some places, large panels of solar cells harvest sunshine to make electricity for homes and businesses. Solar cells have been placed on cars and appliances, too.



A solar panel is used to provide energy to this phone booth.



This solar water heater is one of many used to heat water for the town of Mejanne Le Clap, France.

A solar heat collector uses the sun's energy to heat water. These solar heat collectors are often placed on rooftops. Water circulates through pipes in the panels, and the sun's radiant energy heats the water. The heated water is pumped into a building through more pipes. The heat leaves the water and heats the inside of the building. Then the cooled water returns to the rooftop to be heated again.



Rooftop solar panels provide this house with energy.



In some areas of the world, such as the southwestern United States, there are many sunny days. In these places, solar cells and solar panels can produce lots of electricity and heat. Since the sun sends abundant free energy streaming toward Earth 24 hours a day, people in many parts of the world, not just the sunniest places, have mounted solar cells and solar panels on the roofs of their houses or businesses to lower their energy costs.

Experts say that huge installations of solar panels in sunny regions could generate enough electricity to supply an entire country. Capturing this energy can help overcome our diminishing energy supply. New ways to capture this energy are being developed all the time to maximize efficiency.



There are two main problems with solar cells. One is that they are very expensive to manufacture. Their cost makes hydroelectric and fossil-fuel power plants a cheaper source of energy. Until inexpensive manufacturing is developed for solar cells, this free energy source will continue to come at a high cost to capture and convert to electricity.

The second problem is that not all areas of the world get abundant sunlight. Other sources of energy would be needed as a backup to the solar cells, which adds to overall energy costs.

Some people who live near houses that use solar cells and solar panels think the rooftop systems are ugly. They believe the look of the solar systems will decrease the value of their homes.



Power plants could serve as back-ups for solar farms.

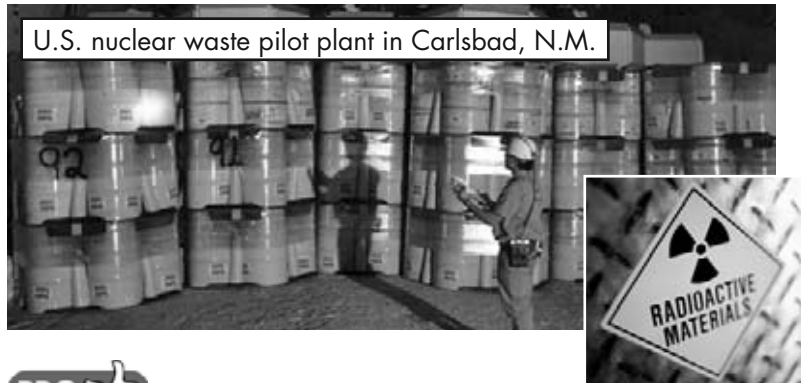
Nuclear Power

Nuclear power plants unlock the energy inside atoms to generate electricity. Each splitting of an atom releases energy. An atomic bomb explodes by creating a very rapid chain reaction. A nuclear power plant uses the radioactive element uranium to create a slow, controlled chain reaction.

The energy released by breaking apart uranium atoms is used to heat water into steam. The steam is then used to generate electricity in much the same way that coal power plants produce it.



Cooling towers keep the core of a nuclear power plant at a safe temperature.



PRO 

Uranium releases an incredible amount of energy. One kilogram (2.2 lbs) of uranium can produce more energy than 3 million kilograms (6.6 million lbs) of coal. Nuclear power plants have another advantage over coal power plants: They do not produce gases that can pollute the skies or add to global warming.

CON 

Many people oppose nuclear power because of its dangers. One danger is the possibility of an accident. A nuclear power plant can't explode like an atomic bomb. However, it can have a steam explosion if the core (the area containing the uranium) gets too hot. This would spew out a lot of dangerous radiation. A second danger is the waste material nuclear power plants produce. Even when uranium is no longer useful for generating electricity, it is still highly radioactive. It remains dangerous for thousands of years.

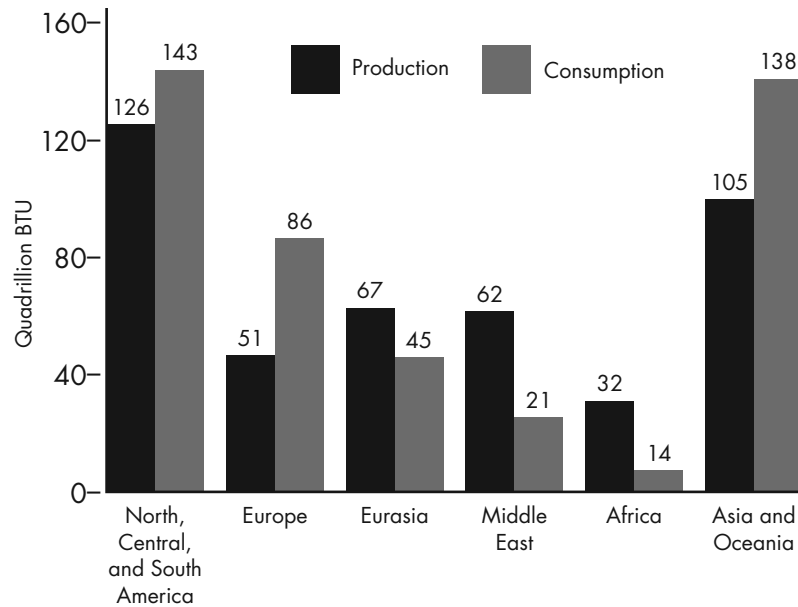


Wind turbines could provide more energy in the future.

Looking to the Future

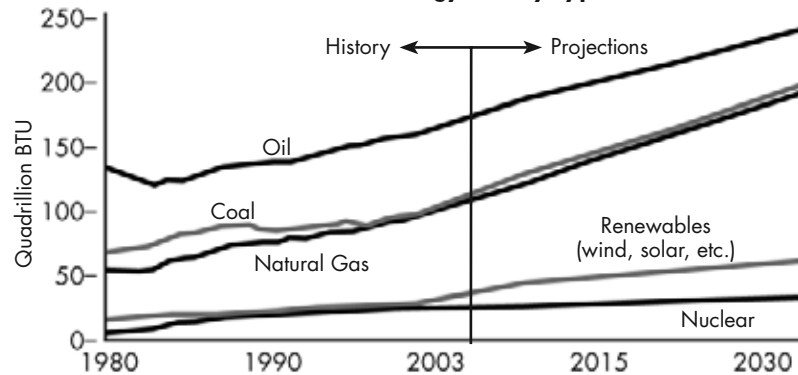
In years to come, we will have to find substitutes for oil. Hydroelectric power may also be replaced, too. Many people are concerned about the environmental effects of dams and would like to see many dams torn down. The use of solar energy will probably continue to grow. Energy experts also say that more nuclear power plants will have to be built to meet growing energy needs.

World Energy Use and Creation by Region, 2004



Three regions of the world use more energy than they create. Why do you think that is the case? Where do these regions find their extra energy sources?

Past and Estimated Future Energy Use by Type, 1980–2030



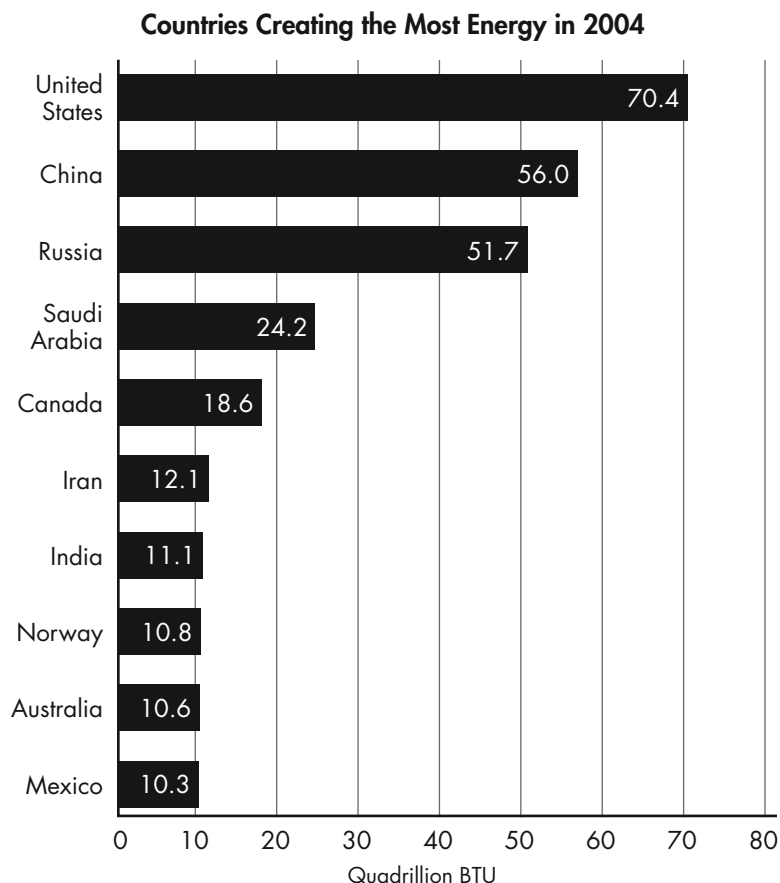
Using current rates as a guide, this chart shows the growth in the world's energy use between now and the year 2030. Experts project that oil will not be available in the decades to come. What does this chart and information tell you about energy use in the future?

SOURCE: U.S. Energy Information Administration, Annual Energy Review 2005

Scientists are also researching other ways to generate energy, such as using wind turbines or geothermal energy. Wind turbines generate electricity when their blades turn in the wind. The turbines require no fuel and don't create pollution, but they are huge and can kill local birds. Geothermal energy comes from deep underground where the Earth is very hot. Water can be circulated down into the ground in pipes to absorb that heat. The hot water can then be used to heat homes and buildings. However, in many areas, the underground heat can be difficult and expensive to reach.



Geothermal plant



Two things are certain. We need energy, and the fossil fuels that supply most of our energy will not last forever. Finding renewable alternatives is key to the world's energy future. Scientists will continue to do research. Each new source of energy will have its pros and cons. Governments, businesses, and **environmentalists** will continue to debate which energy sources are best while our need for energy continues to grow.

Glossary

energy (<i>n.</i>)	different types of power that people and machines need to do work (p. 4)
environmentalists (<i>n.</i>)	people concerned with keeping Earth's ecosystems healthy (p. 23)
fossil fuels (<i>n.</i>)	energy sources taken from the earth, including coal, oil, and natural gas (p. 6)
global warming (<i>n.</i>)	the worldwide rise of temperatures through air pollution trapping heat (p. 9)
hydroelectric (<i>adj.</i>)	produced from water as a source of electricity (p. 10)
pollutants (<i>n.</i>)	harmful materials from using fossil fuels, which make the environment dirty (p. 9)
sediment (<i>n.</i>)	bits of earth carried by flooding (p. 13)
turbines (<i>n.</i>)	wheels that spin when the force of water, air, or steam is applied (p. 10)

Index

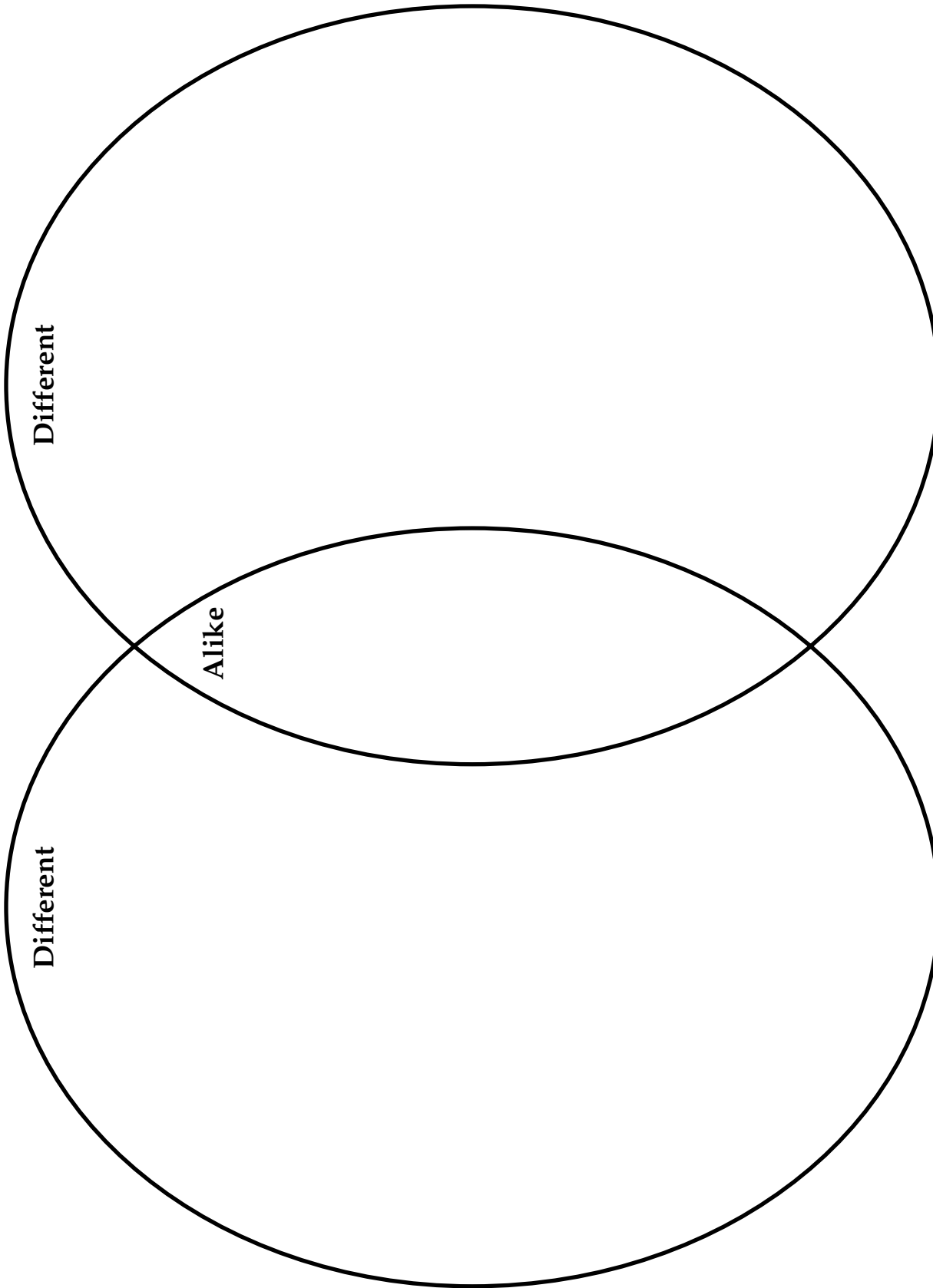
carbon dioxide, 8, 9	natural gas, 6, 8, 9, 21
coal, 4, 6–9, 18, 19, 21	nuclear (atomic), 18, 19, 21
dams, 10–13, 20	oil, 6–9, 20, 21
floods, 12, 13	pollution, 9, 22
fossil fuels, 6–9, 23	solar, 14–17, 20
gasoline, 4, 6, 8	steam, 18, 19
geothermal, 22	sun, 4, 14–17
global warming, 9, 19	uranium, 18, 19
hydroelectric, 10–12, 17	water, 4, 6, 10–13, 15, 18, 22
kerogen, 7	wind, 20–22

Name _____

Instructions: Write the two topics you are comparing. Write details that tell how the topics are different in the outer circles. Write details that tell how the topics are alike where the circles overlap.

Topic: _____

Topic: _____



Different

Alike

Different

Name _____

Instructions: Read the sentences below. Then identify the independent clause, the dependent clause, and the conjunction, writing them on the lines provided.

1. Fan-like blades inside the turbines spin when water rushes through them.

Independent clause: _____

Dependent clause: _____

Conjunction: _____

2. When the turbines spin the generators, they move electrons in the coil of wire.

Independent clause: _____

Dependent clause: _____

Conjunction: _____

3. When sunlight hits a solar cell, the cell absorbs some of the light energy.

Independent clause: _____

Dependent clause: _____

Conjunction: _____

4. Governments will continue to debate which energy sources are best while our need for energy continues to grow.

Independent clause: _____

Dependent clause: _____

Conjunction: _____

5. When uranium is no longer useful for generating electricity, it is still highly radioactive.

Independent clause: _____

Dependent clause: _____

Conjunction: _____

Name _____

Instructions: Write synonyms and antonyms for each bold-faced word in the box. Then use a synonym and antonym for each bold-faced word in a sentence on the back of this worksheet.

Synonyms	Word	Antonyms
	abundant	
	best	
	easy	
	harmful	
	heavy	



The Message

A Reading A-Z Level Z Leveled Reader

Word Count: 2,500




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Reading Recovery	29
DRA	N/A



Table of Contents

Secret Meeting	4
Jacques's Mission	10
German Patrol.	13
Radio Broadcast	18
Dangerous Return	22
Author's Note.	23
Glossary	24

Caen (KAHN), France [located in the Normandy region of northwestern France, about 16 kilometers (10 miles) inland from the English Channel], 1944

Secret Meeting

"Red lanterns burn brightly in Suez." Aimee whispered the password into the barn.

"Mostly when it rains." The stranger murmured his portion of the password from behind the heavy wooden door as he creaked it open, glimpsing Aimee and her companion. Day was fading into night, and in the feeble light she guessed he was maybe 18 or 19. She wished he would hurry because each time the cold February wind rustled the trees, she thought a soldier was approaching. He hesitated; then he **warily** opened the door.

"Come in," he said in a voice as stiff and cold as the onshore breeze. Aimee stepped over the threshold into the old brick barn, carefully holding her elbow **askew** so young Jacques could follow her. Behind them the stranger slid a wooden plank through metal brackets on each side of the door.

"Why did you bring your little brother? I was not told two people were coming tonight."

"Jacques is not my brother, but he is the one with news and he needed help finding you."



Fifteen-year-old Aimee and the stranger worked for the French Resistance, a secret group of ordinary citizens living in German-occupied France. They did whatever they could to help England, the United States, and other Allied countries stop the German **dictator** Adolph Hitler from taking over Europe during World War II. Aimee's contact in the Resistance had requested that she meet Jacques near Caen's railway station this afternoon and escort him to this barn. She had been given only vital information: the barn's location and the password to enter. She watched as the stranger **scrutinized** Jacques's appearance, but when he noticed the **vacant** look in Jacques's eyes, he relaxed.

"Oh, of course." His voice softened. "We haven't been properly introduced. I'm Pierre."

"Pleased to meet you. I'm Jacques La—"

"Ah-ah-ah," interrupted Pierre. "First names only to keep us all safer." He offered the visitors a comforting smile as he invited them to sit down in a horse stall, vacant except for bales of hay and a picnic basket.

A single lightbulb hung from the low rafters, its light only bright enough to hint at what lay in the barn's corners. As ordered by the Germans, **blackout** material covered the windows to prevent light from shining out, but the French counted on it to prevent German soldiers from spying in.

Straw from the animal stalls spilled onto the stone floor, and the sweet aroma of hay mixed with the **pungent** smell of cattle. As she'd been taught to do, Aimee scanned the interior of the barn for potential hiding spots in case the German soldiers should appear. Getting caught sending information to the enemy meant prison, or worse. But the three in the barn were willing to take that risk if it helped free their beloved France from Hitler's grip.



Aimee stepped forward and Jacques followed, his hand still resting in the crook of her arm for guidance and peace of mind. "Promise to keep me away from the cow pies," Jacques joked.

"Yes, of course," Aimee laughed. "But how did you know there were cow droppings? I thought you couldn't see anything."

"My eyes may be useless, but my nose works just fine," he smiled. Each of them sat calmly on

a bale of hay, but their tense faces revealed that they all anticipated a more serious turn in the conversation.

"You must be hungry after your journey. Would you like some cider and pastries?" asked Pierre quietly.

"Pastries?" Jacques snapped to attention.

"Where did you find flour to make pastries?" asked Aimee. "You must have saved **ration** coupons for months."



Do You Know?

In 1824, a fifteen-year-old blind French boy, Louis Braille, invented a reading and writing system of raised dots on paper. People around the world who are blind or visually impaired still use his system, Braille, today.

"Maybe I shouldn't call them pastries," Pierre replied. "Mama makes them with mashed potatoes, not flour, but they're tasty." He pulled a bundle from the basket and handed Aimee and Jacques a pastry each.

"What would we do without potatoes? I think we eat them at virtually every meal," Aimee complained.

Jacques eagerly ate his portion. "Mmmm . . . I haven't had these since the war began."



Jacques's Mission

"Do you remember much from before the war?" Pierre asked. "The Germans have been here for almost four years now, so you must have been very young when it all began."

"I was five when France surrendered," Jacques said between mouthfuls. "But good tastes I remember."

"And long for, if you are like me," Pierre agreed as he drank his cider and then brought the subject around to the night's mission. "So it must be you, Jacques, who lives on the coast."

"Yes, my family's farm is high on a cliff above the English Channel, less than 10 kilometers from this barn. We raise cattle and grow corn and barley." Jacques hesitated. "At least we used to, until the Germans built **bunkers** on our land."

"Bunkers?" Pierre looked intensely interested.

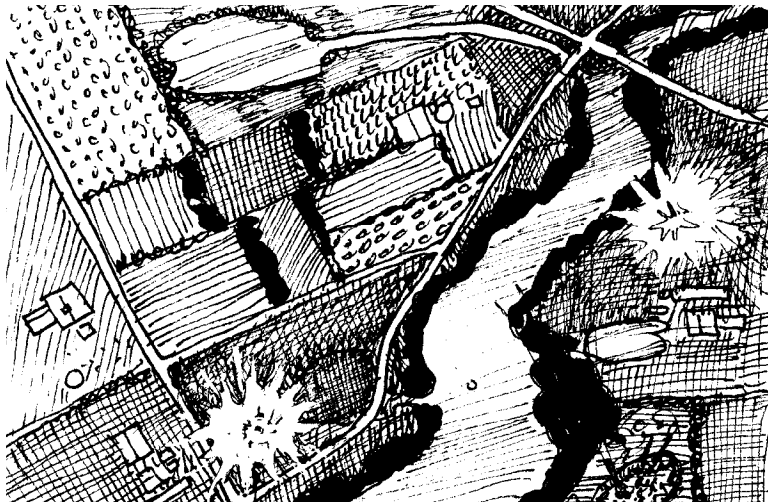
"That's why Papa sent me to you. He's furious that the German soldiers took over a whole section of our farm, and he couldn't do anything to stop it," Jacques said loudly.

"Shhh, my friend," Pierre interrupted. "These walls are thick, but we cannot risk loud noises

when the German patrol might be lurking nearby like hawks ready to swoop down on three mice."

"Sorry," Jacques mumbled. "Papa says the Germans are hiding four huge guns. They built shelters and surrounded them with dirt; then they hung nets above them. Every few nights we hear Allied planes flying overhead, which Papa assumes are taking **aerial** photographs, trying to figure out what the Germans are doing. But the guns are too well camouflaged to be spotted from the air."

"Your father is probably right," Pierre agreed. "And since your land overlooks the water, the guns must be waiting to sink any Allied boat that tries to come ashore!"



Nighttime view of occupied French farmlands as seen from an Allied spy plane.

Aimee's pulse quickened. This information could save hundreds or thousands of lives when the Allies arrive, but if the Germans discovered they were sending messages to England . . .

Jacques nodded, satisfied that Pierre now grasped the gravity of the situation. "There is a tall observation pole on our land that the Allies will need to know about. I counted the number of steps it takes to walk from the pole to the westernmost bunker, from bunker to bunker, and from the edge of the cliff to the bunkers."

"Excellent," Pierre whispered excitedly. "Did you write it down?"

"No! If I were caught with that information . . ." Jacques shuddered.

"But I count steps every day—how many steps across a room, or to the barn—I can remember any number of steps."

"You're certainly brave," Aimee remarked.

"The Germans don't suspect a blind kid of doing anything important."

Try It!

In an open field, count the number of steps it takes you to walk between two spots. Try it several times. Now repeat the walk with your eyes closed. Did you reach the same spot?

German Patrol

"How will you send this information to England?" Aimee asked Pierre.

"By radio," he replied, with a spark of excitement in his eyes.

"Radio? But how will we—" Jacques froze.

Then Aimee heard it too—voices. She glanced at her companions; Jacques was a statue, and even Pierre showed concern with a crouched posture and clenched fists.

"The German patrol," Pierre whispered.
"Follow me—quickly!"



Grabbing Jacques's wrist, he bolted from the stall. Aimee followed them to a triple-wide stall—almost running into a cow's large backside—and saw Pierre pointing to a stack of hay bales. Aimee nodded in understanding, wordlessly guiding Jacques through a narrow entrance into the hay cave and following close on his heels. Pierre placed another bale over the opening and then darted to his own hiding spot, completely out of Aimee's field of vision. Now the girl could experience the barn as Jacques did.

From inside the barn, the soldiers' voices were too muffled to be understood. Did they suspect **clandestine** activity or was this their routine patrol? Aimee wondered whether Jacques realized how precarious their situation was. If the Germans found a radio transmitter in this barn, they would all be labeled as spies, no matter what story they **fabricated**. All three of them would be hauled away tonight—just disappear—without their families knowing what had happened to them.

Aimee felt like a mouse hiding from a cat. The soldiers called back and forth to one another but never tried the barn door. The three young Resistance workers waited silent and still like stalked rabbits—long after the soldiers' voices died away—before emerging from their burrows.



"They've moved on by now," Pierre whispered confidently when he reappeared.

"Wouldn't it be foolish to use a radio transmitter now?" asked Aimee as Pierre moved a bale and helped her exit the cave first.

"Perhaps, but I think we must," Pierre answered. Now he helped Jacques back to his feet, pulled loose straw from the boy's collar, and guided him back to the other stall.

"But what if the patrol is still around?" Aimee persisted, while peering toward the door.

"I doubt they would have been so loud if they had suspected anything. Still, we will have to be careful to avoid sending too long of a message. The Germans constantly listen for radio broadcasts, and when they detect one, they need just ten minutes to pinpoint its origin."

"And swoop in to arrest the broadcaster and his helpers . . ." Aimee gulped.

"That is why our broadcast to the Allies *must* be under nine minutes; it is too risky to go longer."

"How will we know if the Allies have received the message?" Jacques asked.

"That, my friends, is a good story," Pierre chuckled. He knelt beside the basket and pulled out a small tin can with a torn label. "Jacques, I am holding what looks like an ordinary tin can, but inside . . ." Opening it slowly, he dumped out a few dried beans and showed Aimee the hidden contents of the tin can.

"A radio!" she gasped.



"I thought radios were banned," Jacques said.
"We had to give ours to the Germans."

"I made it myself," Pierre answered proudly.
"The microphone, transmitter, and headset are hidden nearby, so after we send the message tonight, I can listen to the British radio station—the BBC—nightly. They read the news in French three times a day." Pierre put the radio back and stepped into the corner of the stall to rummage through a pile of hay, continuing his explanation.
"At the end of those broadcasts the announcer says, ' . . . and here are some personal messages.' These are coded messages for Resistance workers. When we send messages we each use an **alias**, and when the British receive a message, they reply to the aliases we used."

Pierre removed a small steel box with black knobs and dials, and two black rubber hoses flopping around behind it. He set the transmitter on the ground and extended the antenna. He handed a pocket watch to Aimee, who was on pins and needles.

"Your job is to keep track of time. As each minute passes, hold up another finger." Aimee set the watch face-up on her lap and nodded. "We cannot, under any circumstances, go past nine minutes."

Radio Broadcast

Pierre untangled the two tubes, which he connected to the headset and microphone. He adjusted the beret covering his short-cropped hair, placed the headset over his ears, and turned a knob, making the transmitter crackle to life.

"This is Victor Hugo with a message for . . ." Pierre began. "The tunnel extends from the officers' quarters to . . ." Pierre droned into the microphone. As he talked, Aimee became overwhelmed with dread; Pierre had more to relay in nine minutes than Jacques's information alone. While holding up one finger, she imagined what would happen if they were discovered.

"Railcars loaded with steel **reinforcements** were seen heading toward . . ." Two fingers . . . three. Aimee struggled to keep her hand from shaking. She **steeled** herself against the fear rising inside of her; if soldiers could face battle, the least she could do is help send them information. Two more minutes ticked past. Would they send it all before the Germans could detect the source of the radio transmission?

Finally, Pierre tapped Jacques's knee and whispered, "Ready when you are, friend."

Aimee allowed herself a calming sigh. Jacques recited his information as Pierre repeated it into the microphone: types of guns, the location of each bunker—Aimee held up two more fingers—and a description of the bunkers. Aimee rapidly shook eight fingers at Pierre.

“Jacques,” she whispered, “don’t forget the location of the observation pole. But make it quick—we have less than a minute!”

“Oh . . . right,” stammered Jacques. He nervously rubbed his hands together, giving Aimee a sinking feeling that he couldn’t remember this essential piece of information.



“Forty seconds,” Aimee cried out, unable to hide the alarm she felt. “Thirty . . .” Did she hear footsteps or was that blood pulsing in her ears?

Jacques took a deep breath.

“Twenty seconds!”

“Oh!” He jumped up. “I remember . . . it is 2.7 kilometers west of the fishing boat harbor.”

Pierre rapidly **dispatched** this last tidbit of information and signed out. He clicked off the transmitter, stood up, and congratulated Jacques. “Good work, my friend. Tomorrow I will have good news to share at church.”

The visitors asked in unison, “At church?”

“Every morning at 6:30,” Pierre chuckled. “My contact and I attend, and during the service we switch prayer books. His contains questions or describes an assignment—like meeting you here tonight—and mine has answers to his older questions or news of completing an assignment.

“You may have saved many lives tonight. Hopefully, before the troops storm the beaches near Jacques’s farm, they will knock out the Germans’ guns and help **liberate** France!”

“I am glad I could help,” Jacques replied.



"Now I must send you home for the night—it may not be safe here for long," Pierre said as he **concealed** the radio in its bag. When he returned, the three gathered their belongings, headed for the door and listened. Pierre lit a lantern and scanned the darkness. Satisfied, he signaled Aimee and Jacques, who scampered down the gravel road leading away from the barn, every step putting more distance between them and the illegal transmitter. In the darkness, Pierre waved goodbye to his new friends.

Dangerous Return

"We're almost there," Jacques said excitedly, "and Marie has soup waiting for us."

"That sounds wonder—" He stopped suddenly. "What is it, Jacques?"

"Someone's coming," he whispered.

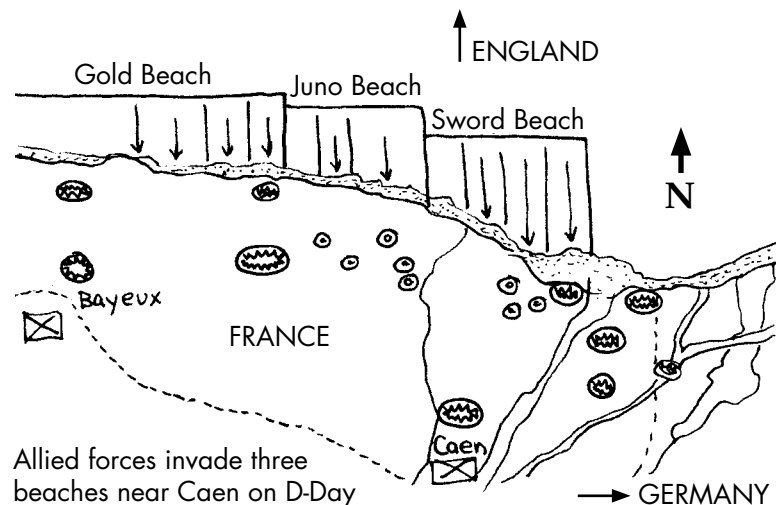
"I don't hear any—" Aimee gasped, as two intimidating German soldiers suddenly emerged from the darkness with their guns drawn. She was sure that "guilty" was written across her face. A light blinded her eyes then moved on to Jacques. She flinched as it blinded her again and then returned to Jacques. She felt Jacques clutch her arm like a steel trap, but she was already protecting him as best she could. Jacques put up his own defense: look as helpless as possible by reaching out into space with his free hand. Would the men fall for this well-rehearsed act?



One soldier grumbled in German, “It’s only the blind kid,” which made the other one nod in agreement, and the two of them moved on.

“Nice work,” Aimee whispered, now a safe distance from the threat.

Jacques smiled, his head held high. “If they only knew.”



Author's Note

The characters and events in this story are fictional, but Jacques and Pierre are based on real people. In February 1944, an eight- or nine-year-old blind boy made his way to Caen, France, to tell Andre Heintz, a French Resistance worker, about the bunkers Nazi soldiers had erected on his family's farm. This information was sent to England so that on D-Day — June 6, 1944, the day the Allies invaded Germany-occupied France—the guns were targeted and eliminated.

Glossary

aerial	taking place in the air (p. 11)
alias	a name used instead of one's real name (p. 17)
askew	off to one side (p. 4)
blackout	accidental or intentional shutting of all lights (p. 6)
bunkers	protective underground forts (p. 10)
clandestine	secret or undercover (p. 14)
concealed	hid from view (p. 21)
dictator	a leader who rules with unquestioned power, usually by force (p. 5)
dispatched	sent off (p. 20)
fabricated	came up with a lie (p. 14)
liberate	to set free (p. 20)
pungent	having a strong smell (p. 6)
reinforcements	extra military troops or supplies (p. 18)
scrutinized	examined carefully (p. 5)
steeled	made oneself tougher or stronger (p. 18)
vacant	empty (p. 5)
warily	carefully; cautiously (p. 4)

Name _____

Instructions: Fill in the *Make* section with your prediction(s) about what will happen in *The Message*. Fill in the *Revise* section to make changes to or add to your prediction. Write a check mark in the *Confirm* section if the prediction was correct, and write what actually happened in the *Actual* section.

Actual					
Confirm					
Revise					
Make					

Name _____

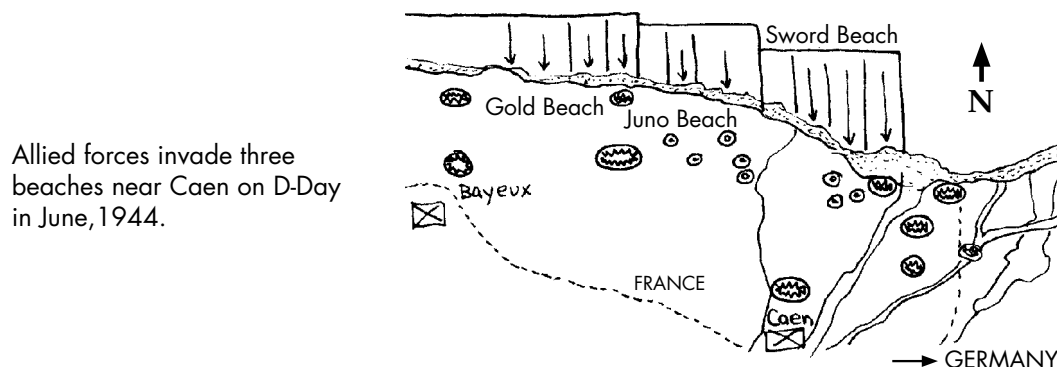
Instructions: Write one character's name on the line in each of the boxes to the left. Underneath the name, list the character's traits in the box. In the boxes to the right, list the story clues that helped you identify each trait.

Character traits for: _____ 	Evidence: _____ _____ _____ _____ _____ _____
Character traits for: _____ 	Evidence: _____ _____ _____ _____ _____ _____
Character traits for: _____ 	Evidence: _____ _____ _____ _____ _____ _____

Name _____

Instructions: Read the sentences below and decide whether they contain dashes or hyphens. Then write *dash* or *hyphen* on the line to the left of the sentence.

1. _____ Fifteen-year-old Aimee worked for the French Resistance.
2. _____ Then Aimee heard it too—voices.
3. _____ They were part of a secret group in German-occupied France.
4. _____ Follow me—quickly!
5. _____ Aimee followed them to a triple-wide stall.
6. _____ He adjusted the beret covering his short-cropped hair.
7. _____ “But make it quick—we have less than a minute!”
8. _____ “That sounds wonder—” He stopped suddenly.
9. _____ Would the men fall for this well-rehearsed act?
10. _____ “Now I must send you home for the night—it may not be safe here.”



Name _____

Instructions: Read the sentences below and decide which ones contain a simile. (Remember to look for the key word *like* or *as*.) Below each sentence containing a simile, write which two things are being compared. If the sentence does not contain a simile, leave the line blank. Then write two similes of your own on the lines provided.

"My eyes may be useless, but my nose works just fine," he smiled.

2. The three young Resistance workers waited silent and still like stalked rabbits.

3. Aimee felt like a mouse hiding from a cat.

4. Jacques froze like a statue when he heard the voices.

5. As soon as the soldiers left, Pierre pulled out the radio.

My similes:

1. _____

2. _____



Ella Fitzgerald

A Reading A-Z Level Z Leveled Reader

Word Count: 1,937

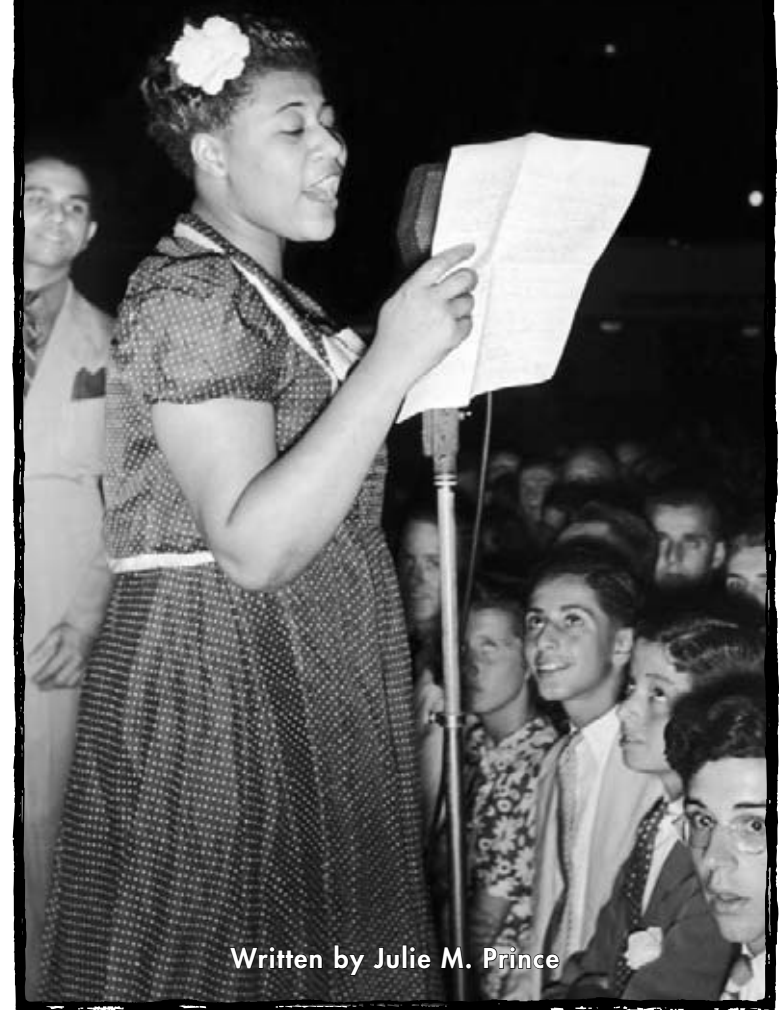



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Ella Fitzgerald



Written by Julie M. Prince

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Ella Fitzgerald



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Table of Contents

One Night on Stage	4
First Lady of Song	8
The First Lady's Early Years.....	9
The Lady's Big Break.....	13
The Lady on Tour.....	15
The Lady Makes Her Mark.....	16
The Curtains Close.....	22
Glossary.....	23
Index	24



Ella's career as a performer began at the Apollo Theater.

One Night on Stage

By most accounts of that fateful evening, Ella stood **petrified** in the spotlight when called to the stage. She felt sweat beginning to trickle down the side of her face. She peered down at her heavy, scuffed work boots. There was no way she could possibly dance the way the Edwards Sisters had only moments before. The audience began shifting restlessly in their theater seats. They wanted more, and this big, awkward-looking teenager didn't seem as though she was going to give it to them.

The contest's host, Ralph Cooper, hissed from the wings, "Do something!" He shook his head in **frustration**. He felt that his Amateur Night at the Apollo Theater in Harlem, a neighborhood in New York City, was going downhill quickly, thanks to this girl.

Then Ella leaned over to Benny Carter, whose famous band was accompanying the talent show contestants on that cold night in 1934.

"Will you please play *Judy*?" she requested.

"Sure, kid. I don't see how you're going to dance to a tune like that, but whatever you say."

Taking center stage again, Ella cleared her throat as the music started. Still nervous, her voice cracked on the very first note. The audience huffed a collective moan and began booing and yelling for her to get off the stage. Ella's heart was beating so fast that she thought it might explode.



Benny Carter plays his sax.



Seeing her panic, the band stopped the music and waited. Ella looked at Benny gratefully, took a deep breath, and nodded. The music started over. Ella closed her eyes and stopped hearing the boos, focusing only on the sound of her mother's favorite song. She was back in her kitchen at home. Her mother was alive again. Ella was dancing around the kitchen while her mom sang.

When Ella opened her eyes after the last note floated away, the audience was still. Ella thought she'd disappointed them. Panic rose up her throat. She began to turn and trudge off the stage when one person started to applaud, and then another, and then another. Suddenly, thunderous applause erupted throughout the Apollo Theater. Ella stared blankly at Benny.

“You killed ‘em, kid! They want more! Hear that? What are you going to give as an encore?”

Before she could answer, he turned away from her and launched his band into *The Object of My Affection*. Without missing a beat, and with a grin that nearly split her face, Ella began to sing again.



The inside of the Apollo Theater



Ella's vocal talent brought her much recognition.

First Lady of Song

Madonna. Britney. Shakira. Beyoncé. Like many others, these stars don't need a last name to be recognized. Such **headliners** are often multiple Grammy Award winners and regulars on TV talk shows. They make appearances in movies, record album after album, and are sought out by fellow celebrities who want to be like them and steal some of their glory. It's easy to forget the **predecessor** of them all, a woman who accomplished all of these achievements and more. Winner of 13 Grammy Awards, dominating the music magazine polls as top female vocalist for nearly 40 years, the First Lady of Song is Ms. Ella Fitzgerald.

The First Lady's Early Years

Ella Jane Fitzgerald was born on April 25, 1917, in Newport News, Virginia. Her parents, William and Temperance ("Tempie"), parted ways soon after her birth. Ella and her mother moved to Yonkers, New York, and eventually lived with Tempie's new boyfriend, Joe Da Silva. Joe chauffeured part-time, and Tempie worked at a laundromat and catered on the side. They had a child, Frances, in 1923. Ella and Frances remained close throughout their lives.



Young Ella Fitzgerald

Ella decided by the third grade that she wanted to become a **professional** dancer, and she often entertained people by dancing on street corners. However, Ella also loved singing. She made friends at school by giving realistic **impersonations** of great singers. Louis Armstrong and Connee Boswell were two of her favorites.



The legendary Savoy Ballroom was the "it" place to be for dancing until 1958, when it closed its doors.



When she got a little older, Ella and her friend Charles often snuck off to the Savoy Ballroom in Harlem, where they spun the latest dance steps until they had them mastered. By age fifteen, Ella and Charles were performing their routines in clubs all around Yonkers. Ella was a paid dancer!

But then tragedy struck. Ella's life changed dramatically in 1932 when her mother, Tempie, died from a heart attack. A few months later, Joe also suffered a heart attack and died, leaving Ella and Frances to move in with their aunt in Harlem.

During this time, Ella's grades dropped. She missed a great deal of school and spent time on the streets with people who didn't always obey the law. Eventually, Ella was caught skipping school by truancy officers—people whose job it was to make sure kids were attending school. Ella was sent to live at the Riverdale Children's Association, which had been an orphanage but was made into a **reform school**. Ella rebelled against the rigid rules of the reform school, and it is suspected she was beaten and abused by her teachers. She ran away from the school in the fall of 1934.

As a teenager, Ella lived on the streets. She struggled to make a living by earning tips from singing and dancing in an area of Harlem known as "Black Broadway." Here, all kinds of street entertainment were performed.



Street performers are still common in the streets of New York.

Talent **auditions** were gaining popularity in Harlem nightclubs at that time. After submitting her name for several contests, Ella was chosen to perform at the Apollo Theater's Amateur Night. The prize was to be a weeklong **engagement** performing at the theater. That night, November 21, 1934, seventeen-year-old Ella Fitzgerald found that her true calling in life was not dancing but singing. The audience loved her, and she loved them.

*"It isn't where you came from, but
where you're going that counts."*

—Ella Fitzgerald

Although she won the Apollo's Amateur Night, Ella wasn't permitted to claim the prize of a week's worth of performances. This was likely because of her appearance. Not considered pretty like other female singers, Ella was tall for her age and somewhat overweight. She dressed in men's clothing and work boots, and having spent several months homeless on the street, she wasn't very clean.



Ella performs with Chick Webb's Orchestra.

The Lady's Big Break

The first time Chick Webb—an up-and-coming bandleader—was introduced to Ella, he told the man who introduced them, “You’re not putting *that* on my bandstand!” When that man, Charles Linton, a member of Webb’s band, threatened to quit if the bandleader refused to hear Ella sing, Webb relented. He said that Ella could sing with the band during its two-week **gig** at the Savoy Ballroom. If the audience didn’t like her, she’d be kicked out of the band with no pay.



Do You Know?

At age 21, Ella got her first big hit with the Chick Webb Orchestra. The playful tune she sung used words from an 1800s nursery rhyme, *A-Tisket, A-Tasket*.

Ella sings with Chick Webb.

Of course, the audience loved Ella. Chick Webb and his band grew to adore her, too. They called her “Sis” and purchased a room for her to stay in at the Braddock Hotel. Some of her bandmates took on the daunting task of teaching Ella the best way to comb her hair and what types of dresses were appropriate to wear on stage. Once she learned, Ella became one of the best-dressed singers on tour, and she fell in love with shopping for new clothes.

The Chick Webb Orchestra and Ella began to record songs together on the Decca music label. Some of their songs shot to the tops of the music charts. They toured around the country, and Ella eventually took over the band after Chick Webb’s death in 1939. When the band broke up three years later, Ella continued touring all over the world.

The Lady on Tour

It was difficult for black musicians like Ella to travel from city to city because many times they encountered **racism**. For example, Ella was forced to relinquish her seat on an airplane to some white patrons. This caused the cancellation of one of her concerts in Sydney, Australia. She was unable to get a flight to Australia for three days.

It wasn't the first time, either. Several years before, Ella had been traveling by train. After standing on her feet for hours in the colored section of an overcrowded train car, Ella finally spotted a seat in the whites-only section and sat down. She was promptly scolded by the conductor and ordered to leave the section.



This type of racist behavior didn't faze Ella. She enjoyed sharing her music with everyone. She had—and still has—fans of every race, age, and background. Ella rose above the adversity and bigotry in the same way that she rose above the difficulties of her youth.



Ella could do amazing things with her extraordinary voice.

The Lady Makes Her Mark

In time, Ella became one of the world's most popular **jazz** vocalists. She even helped perfect a new form of jazz singing known as "**scat**." Using only her voice, Ella imitated various orchestra instruments. She combined this skill with **improvised** phonetic sounds, like "bo-dube-be" and "rebop."

Unlike other scat singers, Ella was able to keep her voice perfectly in tune as it fluctuated up and down the musical scales. She had a rare musical ability called "relative pitch." This is the ability to recognize the precise relationship of every note to any note played and to sing it perfectly, in tune, every time. Relative pitch is far more useful than just having "perfect pitch," which is the ability to identify a note upon hearing it.

The new level of artistry she brought to scat singing earned Ella the respect of other big-name performers, including Frank Sinatra, Bing Crosby, Nat King Cole, Louis Armstrong, and Mel Tormé. Tormé, in fact, dubbed her “The High Priestess of Song.” Some of Ella’s biggest fans included celebrities like Marilyn Monroe and Peggy Lee.



Peggy Lee



Louis Armstrong



Ella with Marilyn Monroe

A very small sample of Ella's recording history



Phoebe Jacobs, who worked for Peggy Lee, says that despite her fame, Ella remained a very grounded, casual person. "One time when I was walking with Ella through the streets of New York City on the way to CBS for an interview with Walter Cronkite, I told her to go ahead without me because I was going to stop and get something to eat. She said, 'Well, I'm hungry, too, Phoebe. Where are you going to eat?'"

"I told her I was just going to grab a hot dog from a nearby vendor, and she said she'd like one, too. So, there we were, Ella in her fur coat, standing in the



middle of the street in broad daylight, eating a hot dog with everything on it, when some man walks up to her and says, 'Madam, you look *exactly* like Ella Fitzgerald.' Ella looks right back at him, straight as can be, and says, 'You know, I hear that all the time.' And she just walks off, eating her hot dog!"

A **compassionate** woman as well, Ella spent much of her time and money helping children whose lives presented them with many disadvantages. She helped open several day programs for children and participated in numerous fundraisers to benefit children. She and her second husband, Ray Brown, even adopted a child of their own, Ray Brown, Jr. In later years, Ella was very devoted to her granddaughter, Alice.



Michael Heyman talks with Ella Fitzgerald's son, Ray Brown Jr. (right) on Friday, April 25, 1997.



An Intimate Look

Ella's long-time acquaintance, Phoebe Jacobs, remembers a private party where Ella was singing. "At one point, she took requests from the audience. One young man shouted out, 'Let's hear some rap!' The crowd tittered, but Ella replied, 'Son, I was rapping before you were born!' She then came up with a rap—scat style—on the spot. It thrilled all of us!"



The Curtains Close

Before she died in 1996 at the age of 78, Ella had sold over 40 million records and had performed at Carnegie Hall 26 times. She had appeared in movies and guest-starred on numerous television shows. She was the first black artist to headline at New York's world-famous Copacabana club. She had been presented with the National Medal of Arts by the president of the United States, and awarded the French equivalent, the Commander of Arts and Letters Award. She held honorary doctorates in music from prestigious universities such as Yale, Princeton, and Dartmouth.

Ella Fitzgerald, a homeless orphan from Yonkers, proved that humans can overcome adversity. She achieved what few artists have ever done. She became a **legend** in her own time.

Glossary

auditions	trial performances by actors, musicians, or dancers (p. 12)
compassionate	caring about and wanting to help people who are suffering (p. 20)
engagement	a job that lasts for a short period of time in the entertainment business (p. 12)
frustration	feeling disappointed or distressed, particularly about being unable to change something (p. 5)
gig	a temporary performing job (p. 13)
headliners	performers who are the lead attraction in a show with multiple performers (p. 8)
impersonations	imitations of the voice, appearance, or actions of another to entertain (p. 9)
improvised	made up as one goes along (p. 16)
jazz	a style of music with a strong rhythm supporting improvisations (p. 16)
legend	a famous person who is well respected for a particular talent (p. 22)
petrified	scared; terrified (p. 4)

predecessor	someone who came before another person in the same position (p. 8)
professional	earning money for taking part in an activity (p. 9)
racism	the belief that some people are inferior to other people because of their race (p. 15)
reform school	an institution for young people designed to change unacceptable behavior (p. 11)
scat	a style of jazz singing that uses nonsense words and syllables to imitate the sound of an instrument (p. 16)

Index

Apollo Theater, 4–7, 12	philanthropy, 20
Carnegie Hall, 22	recording, 14, 18, 22
Carter, Benny, 5	school, 11
Copacabana club, 22	sister, 9
Fitzgerald, Ella,	Jacobs, Phoebe, 21
awards, 8, 22	racism, 15
birth, 9	Savoy Ballroom, 10, 13
death, 22	scat, 16
husband, 20	Webb, Chick, 13, 14
parents, 6, 9, 10	



Name _____

Instructions: In the first box, write what you're curious about. In the second box, write answers to any of the questions in the first box. In the third box, write questions you still have about the topic.

What I'm curious about
Answers to my questions
What I still want to know

Name _____

Instructions: Write a vocabulary word in each *Word Box*. Write a definition for each word in the appropriate boxes. Then use each word in a sentence.

Word Box

①

Definition

Sentence

Word Box

②

Definition

Sentence

Word Box

③

Definition

Sentence

Name _____

Instructions: In the left-hand boxes, write the main idea of each section in the book. In the right-hand boxes, list up to three details that support each main idea.

Main Idea	Details
Main Idea	Details
Main Idea	Details
Main Idea	Details

Name _____

Instructions: Read the sentences below and decide whether they contain dashes or hyphens. Write *dash* or *hyphen* on the line below the sentence. If the sentence contains a dash, write an explanation of how the dash is used.

1. The audience didn't think that Ella, an awkward-looking teenager, could entertain them.

2. Ella had—and still has—fans of every race, age, and background.

3. Ella came up with a rap—scat style—on the spot.

4. Ella became one of the best-dressed singers on tour.

5. Eventually Ella was caught skipping school by truancy officers—people whose job it was to make sure kids were attending school.

6. Chick Webb said that Ella could sing with the band during its two-week gig at the Savory Ballroom.

7. Ella improvised phonetic sounds, like “bo-dube-be” and “rebop” in her singing.

8. Despite her fame, Ella remained the same kind of person that she'd always been—grounded and casual.

Leo the Lion

A Reading A-Z Level Z Leveled Reader

Word Count: 2,274




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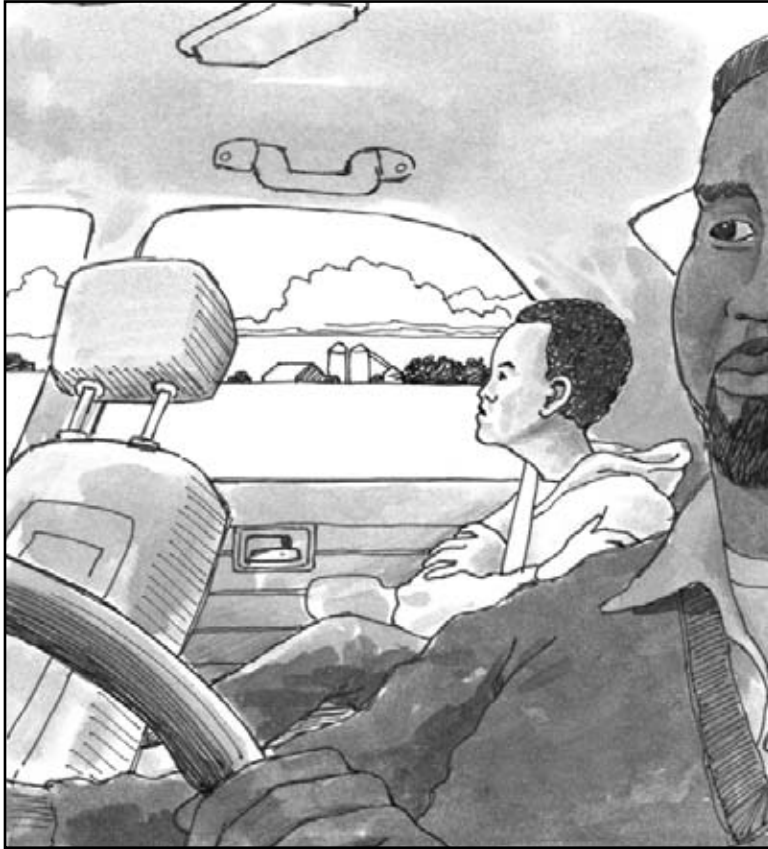
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Table of Contents

Leaving the City	4
Into the Woods	9
The Stars	13
More Noises	19
Back Home	23
Glossary	24



Leaving the City

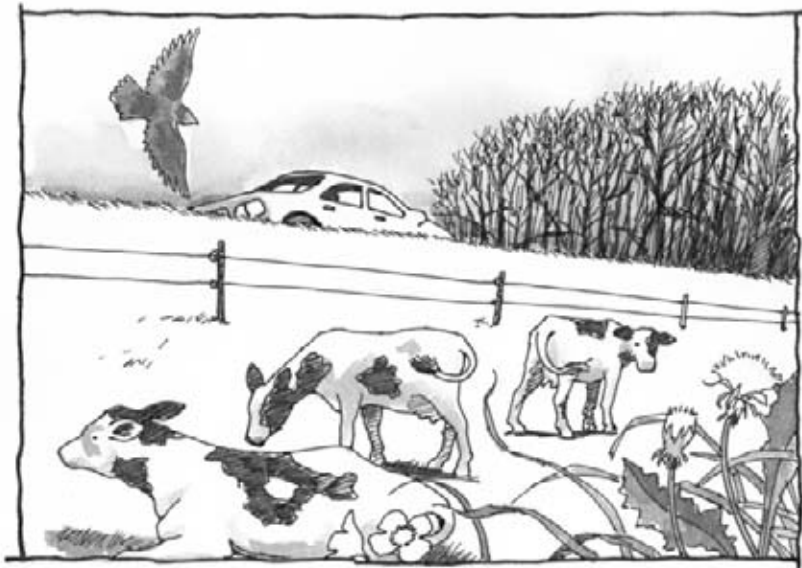
The car ride was long and silent. Leo did not want to leave the city, but his father wanted him to meet his new girlfriend, Lucinda. The boy wished his parents were still together—that they hadn’t divorced—but he felt **resigned** that there was nothing he could do about it. When he asked why his parents separated, his father would often say, “It wasn’t in the stars.”

As they pulled off the highway, Leo noticed how different the scenery looked. Farmhouses and silos dotted the vast plains and lush fields. Herds of cows relaxed with their calves in the cool green grass.

As they ascended the hills, a canopy of trees covered them. It was so different from the concrete pathways, garbage-filled alleyways, and traffic-strained byways to which he was so accustomed.

"You know, Lucinda has a son in the fifth grade, too. His name is Dontrelle. I'm sure the two of you will get along just fine."

"I'm sure," Leo muttered **standoffishly**.



Lucinda's house was **quaint**, tucked back from the road, bordering a forest. She sat on the porch, sipping iced tea from a glass with a slice of lemon clinging to the rim.

"Thomas, you made it." She smiled, skipping down the steps to greet them. Sweeping her arms to take in the view, she laughed, "Not quite like going to the office, huh?"

"It's amazing how different it is out here," Thomas agreed, greeting Lucinda with a grin. Then he put his arm around Leo's shoulder. "Lucinda, this is my son, Leo."

Lucinda extended her hand, but Leo didn't budge, keeping his eyes glued to the ground.

"Sometimes he's a little shy," Thomas tried to explain.

Lucinda crouched down to Leo's height, which didn't require much effort because Leo was quite a bit taller than the average fifth grader.

"My son, Dontrelle, is around back. Why don't you go hang out with him? I think he's about to go fishing. Do you like fishing?"

Leo didn't answer but **begrudgingly** dragged himself off the porch and toward the backyard.

Leo found Dontrelle pushing on a large tree trunk, barely managing to lift it off the ground. Dontrelle was much smaller and shorter than Leo.

"What are you doing?" asked Leo.

"A little help here," Dontrelle said, still straining to move the tree trunk.

Leo joined in, and with their combined strength the two overturned the tree trunk. Worms and bugs, now exposed, slithered around. Dontrelle reached for an old soup can nearby and began scooping in fresh worms and dirt. Leo watched, narrowing his brow.

"Haven't you ever been fishing before?" Dontrelle asked.

"With worms? That's disgusting."

"What do you use?"

"Nothing. I've never been fishing. I live in the city. There's nothing but concrete there."

"Oh."



Leo cracked a faint smile. He decided that Dontrelle was all right. The two exchanged names and handshakes, even though Dontrelle's hands were still covered with worm slime.

"My mom wanted me to take you fishing before dinner, but it's getting late, so we'll have to fish quickly. The sun is about to set. Grab those poles and let's get going."

Leo grabbed two long, skinny tree branches that each had a fishing line and a hook tied onto it. When he looked over, he saw Dontrelle already on the trail, headed into the woods.



Into the Woods

The woods were dense and scented with musty dark pine, the kind of smell that clings to a sweater. Leo coughed as the cloudy scent overwhelmed his senses. He had a difficult time adjusting his eyes to the shadows in the diminishing light, and he tripped over a few **protruding** birch roots. Dontrelle paid little attention to Leo as he maintained a steady pace toward the creek.

A sudden rustling in the nearby trees made Leo jump. "What was that?" he yelped.

"Nothing to worry about—probably just a squirrel," Dontrelle called back in an attempt to calm Leo's nerves.

It didn't work—Leo's breath became heavier and shorter with nervousness. Another noise only **exacerbated** his anxiety.

Leo darted, to the left, to the right, circling wide-eyed. "Is it a bear? Is it a bear?" he huffed.

Dontrelle stopped to look back. "There are no bears here." Just then a fox peered from around a tree, its eyes shining. "But there are foxes," Dontrelle added with a chuckle, pointing for Leo to see.



Leo screamed, dropped the fishing poles, and bolted farther into the woods.

"Wait!" Dontrelle shouted, dropping the container of worms as he chased after Leo.

After a while, Leo's **adrenaline rush** had subsided, and he doubled over in exhaustion. A fatigued Dontrelle finally caught up to him, and both of the boys tried to catch their breath.

"What's the matter with you?"

"I thought that fox was going to attack me," Leo gasped.

"Why would it want to do that? It's more afraid of you—especially now—and besides, it was, like, 20 feet away, just passing through, just like we were just passing through to the creek."

After a pause, Leo asked Dontrelle what had happened to the fishing equipment.

"Good question—I think you ditched it about a mile back, along with your bravery."

"Where are we?" Leo asked, trying to change the topic.

"Another outstanding question."

"Would you knock it off? How was I supposed to know that the fox wouldn't attack me? I've never seen a fox before—except for one time on TV; this hunter was hunting, and . . . and . . . and he got mauled by a bear."

"A fox is not a bear."

"I know that!" Leo shouted, kicking some dirt in front of him.

"Okay, okay. Chill out."

"So, where are we now?"

"I don't know."

"What do you mean you 'don't know'?"

"I mean I haven't been this far out before, and with all of your zigzags, I lost track of where we were."

"Great. And it'll be pitch black out here any minute."

"That actually works in our favor. We'll be able to find our way back more easily in the dark."

"What are you talking about? How can we get back when we can't see?"

"It's in the stars. Walk over to this clearing, look up, and you'll see."





The Stars

Leo looked up and saw a brilliant **array** of stars. His jaw slackened. It was quite a sight. He had never seen such a dazzling sky in the city. With the buildings and the streetlights and smog, that kind of view was impossible.

"Are the skies like this every night?" Leo asked.

"Not on cloudy nights, but otherwise, yeah, it's like this."

The two boys gazed a little while longer, in awe, forgetting for a moment that they were lost. Finally, Leo asked, "So how are these stars supposed to help us?"

"Simple—by reading them. By reading the **constellations**," Dontrelle answered.

"The what?" Leo asked, **incredulous**.

"The constellations—the figures and symbols in the sky that have helped people find their way for 6,000 years."

"Are you crazy? All I see are white dots."

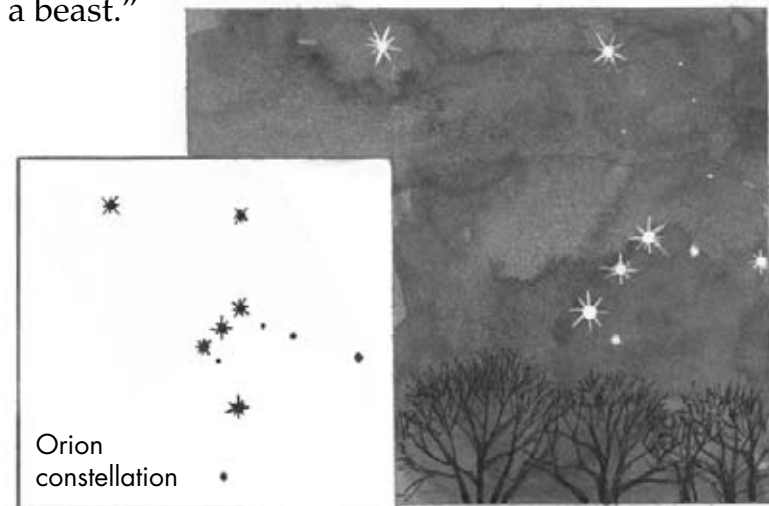
"Dots?" Dontrelle was about to shake his head with disgust but then smiled with an **insight**. "Yes, dots—exactly. All you need to do is connect the dots and you'll be able to see a constellation. Want to try?"

Dontrelle pointed to a row of three stars in a diagonal row. He explained to Leo that by connecting the dots, he would see Orion's belt.

Dontrelle added, "The stars above the belt make up his chest, and the stars below it create his legs."

"No way."

"Orion was a great warrior. If you really use your imagination, you'll be able to see that above his head, he's holding a sword as if poised to attack a beast."



"Wow, I never learned any of this in school. I only learned that stars are far-away masses of burning gas, like the sun."

"Seriously?"

"Yeah, constellations are really cool, except I don't see how they'll help us get home," Leo muttered as he crossed his arms.

"As I was saying before, people have been using star patterns for thousands of years. Fishermen, that is, *real* fishermen, those who ride out to sea on a ship, not those who drop their fishing poles when they see a tiny fox—"

"Hey!"

Dontrelle bit his lip to restrain his laughter. "Anyway, when fishermen were out to sea, they'd look to Polaris—the North Star—to navigate their ships because it was always in the north. Some farmers, even today, use Polaris's relationship to the horizon to determine when to plant their crops and when to harvest them. But if you can find the North Star, you'll pretty much never be lost. The North Star is always in the handle of the Little Dipper."

"The *what?*" asked Leo.

"Look." Dontrelle pointed up to the sky. "See the four stars that make a cup and then a ladle attached to it? That's the Big Dipper."

Once Leo spotted it, Dontrelle explained that the two stars on the end of the cup were **aligned** with a bright star. That star, which begins the ladle of the Little Dipper, is Polaris, the North Star.



"So if we face that star," Leo wondered aloud, "we'll be facing north?"

Dontrelle nodded, and the two boys high-fived each other, jubilant that they had some hope of finding their way back in the dark. The celebration didn't last long, however.

Dontrelle's face grew sour as he realized that knowing where north was didn't help. He confessed that he didn't know which direction they came from.

"Don't worry," Leo said. "When we started out on our expedition, I noticed that the sun was setting in front of us. I don't see many sunsets back home, so it made an impression on me. My science teacher told us once that the sun always 'sets in the west,' which sort of rhymes, so I remembered it. When we left your house, we must have been walking west, toward the setting sun. To get back, we need to face north and walk east—to the right."

Relief washed over Dontrelle's face.

Leo continued, "I suspect that at some point we'll hit that creek of yours. If we follow it back, still heading east, we should come to your house, right?"



"You're a genius!"

Dontrelle and Leo were in high spirits. The two had helped each other with their **respective** knowledge. Both were excited to get back and, since it was long past dinnertime, they were both hungry. But their excitement was short-lived.

More Noises

After just a few minutes, the boys heard noises again. Leo panicked. Dontrelle tried to calm him down, but Leo was far too frightened. He began to breathe faster and dart around again. Knowing that Leo could bolt at any moment, delaying their arrival time even further, Dontrelle distracted him with the stars.

"Did you know that there's a constellation named after you?"

"Stop it—I'm terrified that the fox is after me again."

"Seriously. 'Leo the Lion' is a constellation."

The anxious fifth grader began to listen.

"Really?"



Dontrelle pointed toward the Big Dipper.

"Remember that star on the tip of the cup that pointed to the North Star? Find that same one, but instead look south. See that bright white star, the one that looks almost blue? That's right in the middle of Leo's chest. Some say it's his heart."

Leo followed Dontrelle's gaze into the heavens.

"Legend has it that Leo the Lion had the toughest skin of all the great animals. It was **impenetrable**, so he feared nothing."

Leo and Dontrelle stood in silence for a moment, regarding the lion in the sky. Finally, Leo felt he could be brave like the lion and nodded to Dontrelle that he was ready to continue.

The boys heard the creek before they saw it, but once they caught sight of it they ran to it, overjoyed. The two kicked water at each other and laughed. They had almost made it—now all they needed to do was to follow the creek home.

The boys reoriented themselves one last time before starting to hike again. But their eager steps were suspended in midair when they heard a noise up ahead.

The two froze and strained their ears. Sweat began to bead on Leo's forehead. Dontrelle held his breath. Then it came from behind the bushes—a fox, a mere five feet away.



Its long, bushy tail flicked back and forth. The fox **furtively** crept onto a rock in front of them and slowly craned its neck down toward the creek. Just before its tongue touched the crisp water, Leo shifted his weight onto his other foot, **inadvertently** snapping a twig.

The fox twisted its neck over in Leo's direction and locked eyes with him. No one moved—neither boy nor beast. Then Leo started walking toward the wild animal.

"What are you doing? Are you crazy?" Dontrelle whispered through his teeth.

"I'm just passing through," Leo whispered back.

"What? Why?" stammered Dontrelle.

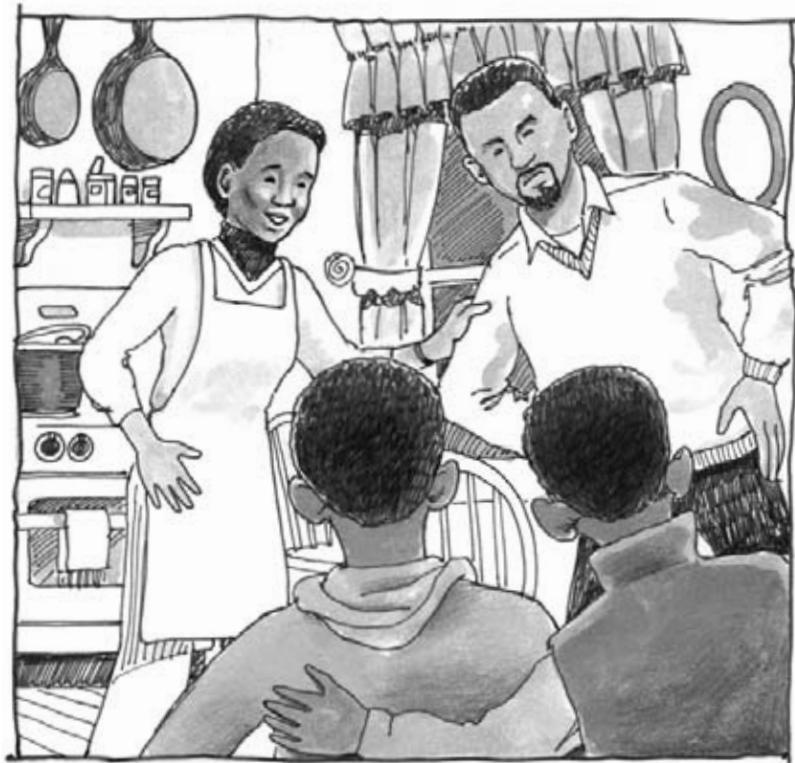
"It's in the stars."

Leo slowly walked toward the fox. After just a few steps, the rust-colored animal bounded away, across the creek and into the woods.

Dontrelle exhaled.

"You *are* the fearless lion."

"I suppose I am," chuckled Leo.



Back Home

When Dontrelle and Leo finally reached the house, their parents scolded them for their lateness but were relieved that they were safe. After a late dinner, Leo and his father prepared for their drive back to the city. Lucinda invited Leo to stay for the weekend, but instead he asked whether she and Dontrelle could visit them in the city. Lucinda promised they would. Leo extended his hand, and he and Dontrelle shook, knowing they would have many more adventures together.

Glossary

adrenaline rush	a surge of energy caused by the body's reaction to stress, in which glands release a hormone that speeds up breathing and heartbeat to make the body ready to respond to an emergency (p. 10)
aligned	lined up with (p. 16)
array	varied collection (p. 13)
begrudgingly	with resentment or ill will (p. 6)
constellations	groups of stars visible from Earth that form distinctive patterns and have a name linked to their particular shape (p. 13)
exacerbated	worsened (p. 9)
furtively	in a sneaky or stealthy manner (p. 22)
impenetrable	unable to be pierced (p. 20)
inadvertently	accidentally; unintentionally (p. 22)
incredulous	not believing (p. 13)
insight	realization; clear understanding (p. 14)
protruding	sticking out (p. 9)
quaint	old-fashioned in an attractive way (p. 6)
resigned	passively accepting; understanding that one has no choice (p. 4)
respective	considered individually (p. 18)
standoffishly	in an unfriendly manner (p. 5)

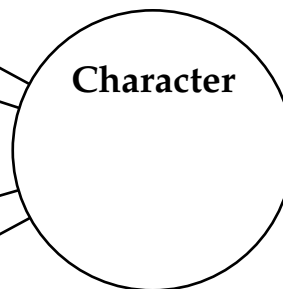
Name _____

Instructions: Write *Leo the Lion* in the circle labeled *Character*. In each box, list a character trait to describe Leo, along with story clues that helped you identify the trait.

Trait:
Clues:

Trait:
Clues:

LEO THE LION • LEVEL 2 • 1



Trait:
Clues:

Trait:
Clues:

SKILL: ANALYZE CHARACTERS

Name _____

Instructions: Read the sentences below and decide whether they contain dashes or hyphens. Then write *dash* or *hyphen* in the middle column. If the sentence contains a dash, explain how the dash is used in the sentence.

Sentence	Dash or Hyphen?	Explanation
The boy wished his parents were still together—that they hadn't divorced—but he felt resigned that there was nothing he could do about it.	Dash	It clarifies why the boy's parents were no longer together.
I only learned that stars are far-away masses of burning gas, like the sun.		
The fishermen looked to Polaris—the North Star—to navigate their ships.		
To get back, we need to face north and walk east—to the right.		
The anxious fifth-grader began to listen.		
They had almost made it—now all they needed to do was to follow the creek home.		

Name _____

Instructions: Write synonyms and antonyms for each bold-faced word in the middle column. Then use a synonym and antonym for each bold-faced word in a sentence on the lines provided.

Synonyms	Word	Antonyms
	dense	
	eager	
	shy	
	silent	
	vast	

1. _____

2. _____

3. _____

4. _____

5. _____

Telescopes: Eyes on Space

A Reading A-Z Level Z Leveled Reader

Word Count: 2,107




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Back cover: Starburst galaxy M82 as seen in data from two telescopes—the WYIN
3.5-meter telescope on Kitt Peak and the Hubble Space Telescope

Telescopes: Eyes on Space
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Table of Contents

Introduction	4
Early Light-Gathering Telescopes	6
How Telescopes Work	10
Modern Telescopes	13
Space Telescopes	17
Radio Telescopes	20
Future Astronomy	22
Glossary	24



NEAT comet, also known as C/2001 Q4

Introduction

For many thousands of years, curious people have gazed into the sky and wondered about the things they saw. Their observations were limited to what could be seen with the unaided eye. It wasn't until about 400 years ago, with the invention of the telescope, that our knowledge of space took a huge leap forward. Since that time, telescopes have evolved into powerful tools for viewing stars, planets, and other objects in space.

There are actually two major types of telescopes. The first type gathers light from distant objects and magnifies images formed by that light. It is called an **optical telescope**, or a light-gathering telescope. The second type of telescope, called a **radio telescope**, collects radio waves from space. While these waves are invisible, they can be converted into visible images.

Read on to learn about the history of telescopes, how they work, and how scientists and others use them to study distant objects in space.



optical telescope



radio telescope

Word Wise

The word *telescope* comes from the Greek word *tele*, meaning "far off or distant" and the Greek word *skopos*, meaning "to watch or look at."



Example of an early telescope

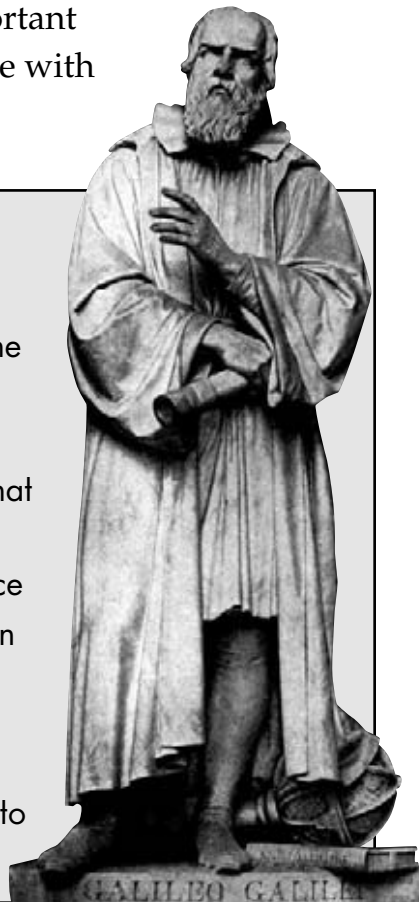
Early Light-Gathering Telescopes

The invention of the telescope was made possible through the development of the glass lens. A lens is a curved piece of glass that bends and focuses light. Early lenses were developed by Italian glassmakers. But it was the Dutch lens maker, Hans Lippershey, whom most historians say was the first person to combine lenses to make distant objects appear much nearer. In 1608, Lippershey used his knowledge of lenses to build the first crude telescope. He put two lenses in line so that the first one magnified the light from the second one. Other people were also experimenting with lenses at the time, but Lippershey was the first to apply for a patent. His invention became an important military tool. The telescope provided a big advantage in warfare, allowing Dutch armies to watch enemy troop movements from afar.

A year after Lippershey invented his telescope, a man in Italy, Galileo Galilei, was hard at work building a telescope for observing objects in space. He greatly improved on the work of Lippershey and other Dutch lens makers, creating telescopes that magnified objects five times and, eventually, thirty times. Galileo used his telescope to observe distant objects in space. Because of this early work, he became known as the Father of Astronomy. Below is a list of the important observations Galileo made with his telescopes.

Galileo's Observations

- Craters and mountains on the Moon's surface
- Four of Jupiter's moons
- Phases of Venus—proving that it orbits the Sun
- Sunspots on the Sun's surface
- The Milky Way's composition as a galaxy of stars rather than a cloud of cosmic dust, as previously thought
- Neptune—though he failed to realize that it was a planet



Galileo's Dilemma

As a professor of astronomy, Galileo was required to teach a model of the solar system that placed Earth at the center and had the Sun and all planets revolving around it. But his observations of space convinced him that a different theory might be more accurate. This theory placed the Sun at the center of the solar system, with the planets revolving around it.

His teaching of this theory upset the Roman Catholic Church because the Church believed that God had designed the universe to revolve around Earth. Galileo's theory **displaced** humanity from the center of the universe and made Earth just one of a number of planets revolving around one of many stars. The Church

banned Galileo's Sun-centered theory and sentenced him to life in prison. But because Galileo was already old, he was allowed to serve his sentence at home, under house arrest, for the rest of his life.



Other scientists followed in the footsteps of Galileo, improving the telescope and revealing even more about objects in space. One of the first was the famous British scientist Isaac Newton. Newton found that a polished, curved mirror could gather light from objects, much like Lippershey's and Galileo's lenses did. Unlike telescopes that use a lens to gather light, Newton's mirror telescope gathered light without separating it into a rainbow of colors. It was also possible to make a mirror larger than a lens. These advantages made Newton's telescope superior to telescopes that only relied on lenses.



Isaac Newton

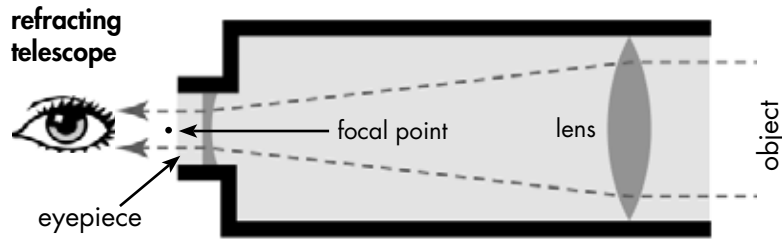
How Telescopes Work

Before we go further into the development of optical telescopes, let's look at how they work to magnify images. All optical telescopes work by gathering light to a point. Those that use a lens to bend light to a center point are called refracting telescopes. Those that use a curved mirror to reflect light to a center point are called reflecting telescopes.

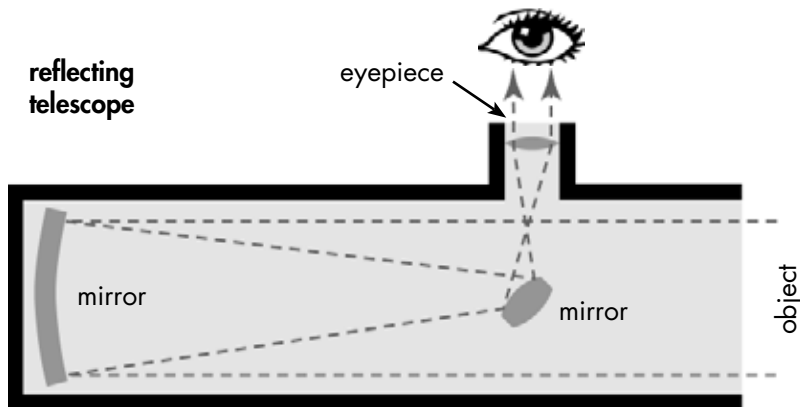
Refracting telescopes have three basic parts—a tube and two lenses. The tube serves two purposes: (1) it holds the two lenses in place at the correct distance from each other, and (2) it keeps out dust and light that would interfere with the formation of a good image.

The larger lens—the one farther from the eye—is a **convex** lens, which means it is thicker in the middle than at the outer edge. Light entering the telescope through the lens is bent to a point called the **focal point**. This forms an image of the object that the telescope is pointed toward. A smaller lens, called the eyepiece, is used to magnify this image before it enters the eye, making the distant object look larger and closer.

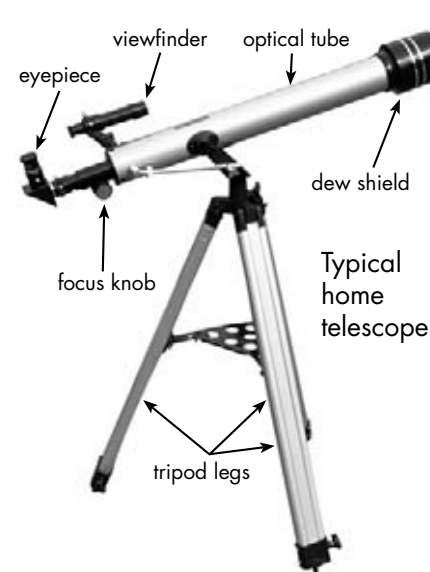




A reflecting telescope has four basic parts—a tube, two mirrors, and a lens. The tube holds the mirrors and lens in place. The primary mirror is a large, **concave** mirror, curved inward like the inside of a bowl. It reflects light to a focal point like a convex lens does in a refracting telescope. The secondary mirror is flat and much smaller. It is used to reflect the image formed by the primary mirror to an eyepiece lens mounted on the side of the tube. The eyepiece magnifies the image. Its placement on the side of the telescope tube allows the user to look into the telescope without blocking incoming light.



Reflecting telescopes have advantages over refracting telescopes. The most important advantage is that making and polishing a large concave mirror is much easier and less expensive than making a large convex lens. It is difficult to make a light-gathering lens more than 10 centimeters (4 in) in diameter. Larger mirrors, on



the other hand, are not only easier to make, but they also can gather more light. The more light a telescope can pick up, the greater the number of dim and distant objects that astronomers can observe in space.

Math Minute

Light is very fast, traveling 300,000 kilometers (186,000 mi) in just one second. The Sun is 149,000,000 kilometers (93,000,000 mi) from Earth. How many minutes does it take light leaving the Sun to reach Earth?

Answer: 8.3 minutes

Alpha Centauri as shown by telescope image



Do You Know?

Distances in space are so vast that astronomers have created a unit of measure called a **light year** to measure them. A light year is the distance that light, traveling at 300,000 kilometers per second (186,000 mi/sec), can travel in one year. This distance is equal to about six trillion miles. The nearest star to Earth, Alpha Centauri, is four light years away.

Modern Telescopes

Regardless of whether a telescope is the refracting or reflecting type, new telescopes are being built increasingly larger. In the 1840s, scientists in Ireland built a large reflecting telescope called the Leviathan. Its mirror was 1.8 meters (5.9 ft) in diameter, which seemed incredibly large at the time.

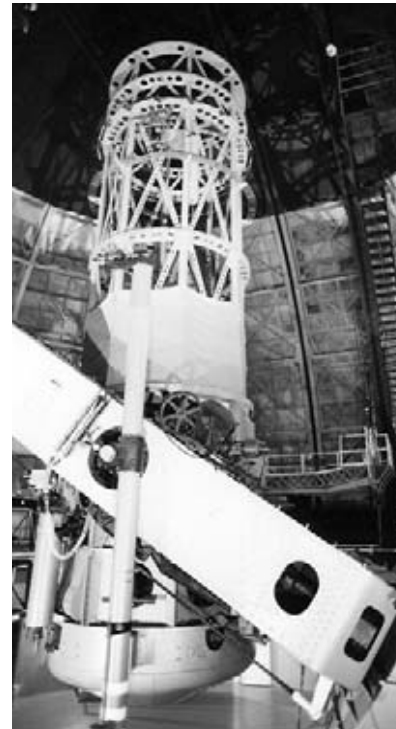
As bigger telescopes were built, people created special buildings, called **observatories**, to house them. Observatories began popping up all around the world. Many of them were built on mountaintops, away from city lights.

In 1897, the United States built an observatory in Wisconsin to house the largest refracting telescope ever built. The telescope's light-gathering lens was extraordinarily large, measuring 40 centimeters (15 in) wide. It was housed in the Yerks Observatory.

Beginning in the early 1900s, new observatories were built with reflecting telescopes. They could be made larger and more powerful than refracting telescopes and, after all, astronomers wanted to see farther and farther into space. Seeing farther required gathering more and dimmer light. Soon, California became a major center for astronomy

with the construction of two large reflecting telescopes.

One of them, housed in the Mount Wilson Observatory, had a mirror 2.5 meters (8 ft) in diameter. Astronomers used this powerful telescope to help prove that many galaxies exist well beyond our Milky Way Galaxy.



The 2.5 m (8 ft) Hooker telescope on Mount Wilson



This building houses the Mount Palomar telescope. The dome opens when the telescope is being used.

The second observatory in California, Mount Palomar, opened in 1948, and its mirror, at 5 meters (16.6 ft) in diameter, was twice as large as the Mount Wilson telescope. This powerful telescope gave astronomers a much sharper view of distant planets and galaxies, revealing space objects that had never before been seen. Reflecting telescopes continued to get bigger. Some had mirrors with diameters of around 10 meters (33 ft). If you were able to set one of these mirrors on its edge next to a building, it would reach the fourth floor. These mirrors had tremendous light-gathering power, allowing astronomers to see even farther into space.

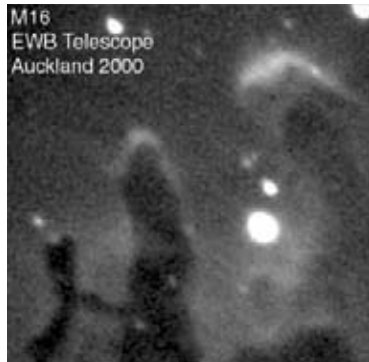
Today's most powerful modern telescopes use the combined power of two large reflecting telescopes that act as one extraordinarily powerful telescope. The newest telescope of this type is located at Mount Graham International Observatory in Arizona. Because in some ways it works like a pair of binoculars, it is called the Large Binocular Telescope, or LBT. Each of the two mirrors that make up this telescope is 8.4 meters (27.5 ft) across. Their combined light-gathering power is equal to a single mirror nearly

12 meters (37 ft) in diameter.



The LBT's two mirrors, encased in the telescope's steel structure, (left) allow astronomers to see 10 times deeper into space than ever before. People who worked on the mirrors pose for a picture (below).





Land-based telescope image



Earth-orbiting telescope image

Space Telescopes

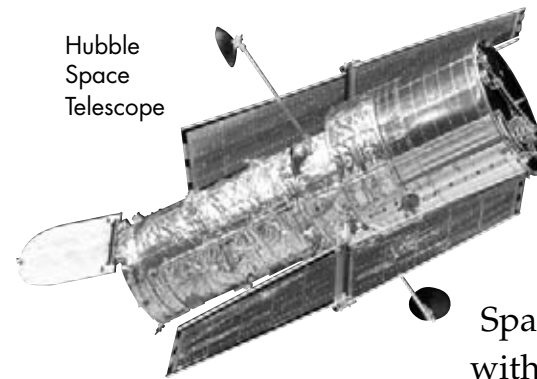
Land-based telescopes have one large drawback. The light they gather from distant objects must pass through Earth's atmosphere to reach them. This atmosphere is a blanket of gases 50 kilometers (30 mi) high surrounding our planet. The gases are in constant motion. Light passing through the atmosphere becomes **distorted**, blurring the images of stars and other objects in space before it even reaches a telescope. The distortion is like looking at an object at the bottom of a clear pool of water. Another problem is that light from some distant objects is so weak that

Do You Know?

The twinkling effect you see when you look at stars is caused by the movement of gases in Earth's atmosphere.

it cannot penetrate Earth's atmosphere. The light gets scattered before ever reaching a telescope.

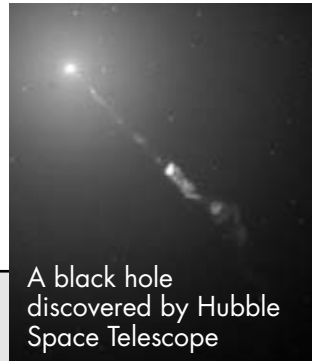
Some of the blurring effect of the atmosphere has been minimized by the use of computers. Computers can predict the amount of movement and adjust the curvature of a telescope's mirror to create sharper images. But even with these adjustments, astronomers realize that land-based telescopes will always have severe limitations when it comes to viewing distant objects in space.



The only way to overcome this problem was to put telescopes above Earth's atmosphere.

Space exploration, with its orbiting satellites and space stations, opened up the possibility of placing a telescope into orbit above Earth's atmosphere. Scientists went to work designing a telescope to orbit Earth and, in 1990, they launched the first orbiting telescope. It was named the Hubble Space Telescope in honor of Edwin Hubble, a famous American astronomer. The Hubble orbits 600 kilometers (370 mi) above Earth, far outside the planet's atmosphere. From its position in space, it has an unobstructed view of distant objects.

The Hubble uses a 2.4-meter (7.8-ft) diameter mirror to form images. Computers and other equipment on the spacecraft convert the light images into radio waves and send them to Earth. Ground stations receive the radio waves and convert them back to images that scientists and others on Earth can view. The Hubble Space Telescope has made it possible to see previously unseen objects in space and to examine previously seen objects in greater detail than ever before.



A black hole discovered by Hubble Space Telescope

Hubble's Discoveries

The Hubble Space Telescope allowed us to see objects we had never seen before. It also provided evidence that answered many questions about the universe. The breakthroughs include:

- first firm evidence of black holes
- proof that planets exist outside our solar system
- first discovery of a rocky, Earth-like planet outside our solar system
- evidence that dust disks—from which planets form—are actually common around other stars
- first view of ancient galaxies, over 10 billion years old
- views of stars and supernovas that allowed astronomers to calculate the age of the universe—12 billion years
- first close-up view of a comet hitting a planet, when Comet Shoemaker-Levy 9 slammed into Jupiter

Radio Telescopes

Before ending our coverage of telescopes, let's take a look at the other type of telescope—the radio telescope. Rather than collecting light from distant objects and magnifying it, a radio telescope gathers invisible radio waves **emitted** by distant formations in space. You might say that radio telescopes listen to space rather than look into space. While optical telescopes are our eyes into space, radio telescopes are our ears on space.



This radio telescope in Puerto Rico is so huge it was built into the valley between mountains.

Most radio telescopes are large dish-shaped structures made of metal. The metal dish collects and reflects radio waves to an antenna in the center of the dish. Most average-

sized radio telescopes have dishes that measure approximately 25 meters (82 ft) across, but the largest dish, located on the island of Puerto Rico in the Caribbean Ocean, is huge—305 meters (1,000 ft) in diameter! Scientists also have linked together a number of radio telescopes in a single location. For example, on a site in Mexico, 27 radio telescopes feed radio signals to a computer that then forms a large single radio signal.

People in Science

Radio astronomy began in 1933 when an American engineer named Karl Jansky accidentally discovered radio waves from space. Jansky built a 33-meter (100-ft) radio antenna mounted on four tires from a Ford Model-T that allowed it to rotate. He built the antenna to study interference that was affecting phone lines strung across the floor of the Atlantic Ocean. Jansky detected static radio waves from thunderstorms and discovered a hissing sound coming from far off in space. He first thought the hissing sound was radiation from the Sun, but he later concluded it was radio waves emanating from the center of the Milky Way Galaxy. This discovery was purely accidental, and several years passed before other scientists took enough interest in Jansky's discovery to build their own radio telescopes.

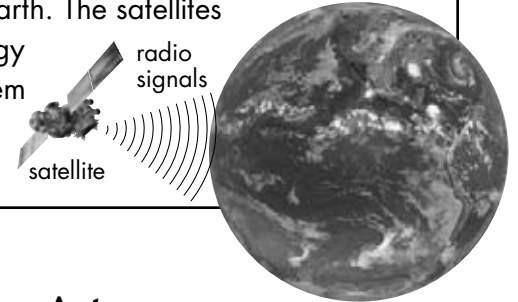


Karl Jansky listens for radio waves.

The radio waves collected by a radio telescope are sent to an **amplifier** that magnifies or increases the strength of the faint radio signals. The amplified signals are then sent to a computer. The computer converts the signals into an image that takes the shape of the radio waves emitted from their source. The computer also assigns different colors to various parts of an image to indicate the different strengths of radio waves within the image.

Do You Know?

Some very high-energy waves are blocked by Earth's atmosphere. Telescopes are placed on orbiting satellites high above Earth. The satellites collect these high-energy waves and change them to radio signals that are then sent to Earth.



Future Astronomy

There is little doubt that future observation of space objects will be best accomplished in space, beyond any interference from Earth's atmosphere. Scientists are hard at work building a telescope that will replace the Hubble.

The new telescope, called the James Webb Space Telescope, will have a 6.5-meter (20-ft) diameter mirror. It will have a tennis-court-sized shield to block the Sun's radiation. The mirror's light-gathering capacity will be ten times greater than that of the Hubble Telescope. The Webb telescope will gather both visible light waves and low-energy infrared waves. In order to get an object this large into orbit, it will be launched folded up and then unfolded in orbit. Scientists hope to peer toward the boundaries of the universe and to learn how the first stars and galaxies formed.



Most scientists agree that the ultimate telescope would be built on the Moon. Scientists are planning an observatory that would be built on the Moon's surface. Since the Moon has very little atmosphere, there would be minimal interference to light coming from distant objects in space. The observatory would house a reflecting telescope that has a 16-meter (53-ft) mirror. Such a telescope would allow scientists to capture images of previously unseen objects and transmit them to Earth.

The mysteries of space are slowly being revealed. No one knows what the newest telescopes will discover, but whatever it is, it surely will be exciting.

Glossary

amplifier	a piece of equipment that makes sounds louder (p. 21)
concave	having a shape or surface that curves inward (p. 11)
convex	having a shape or surface that curves outward (p. 10)
displaced	moved; relocated (p. 8)
distorted	changes so that it is no longer accurate (p. 17)
emitted	sent out from (p. 20)
focal point	a point where light rays come together or from which they spread; lenses and curved mirrors have focal points (p. 10)
light year	a unit of distance in astronomy equal to the distance that light travels in one year (p. 13)
observatories	places used for scientific observation of things in nature, such as astronomical objects (p. 13)
optical telescope	a light-gathering telescope (p. 5)
radio telescope	a telescope that collects radio waves from space (p. 5)

Index

Galilei, Galileo, 7–9	telescopes,
Jansky, Karl, 21	Hooker, 14
Lippershey, Hans, 6, 7, 9	Hubble, 18, 19, 22
Newton, Isaac, 9	Large Binocular, 16
Milky Way Galaxy, 7, 14, 21	Leviathan, 13
Sun, 7, 8, 12, 21, 22	James Webb, 22

Name _____

Instructions: In the first row, write what you already know about telescopes. In the second row, write what you would like to know about them. After you finish reading, fill in the third row with information you learned.

K: What I already know
W: What I would like to know
L: What I learned

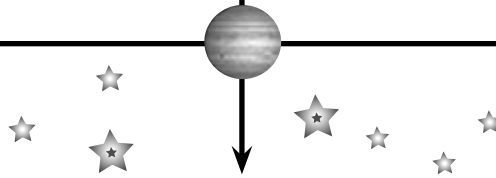
TELESCOPES: EYES ON SPACE • LEVEL Z • 1

SKILL: KWL/ASK AND ANSWER QUESTIONS

Reading a-z

Main Idea	Details

TELESCOPES: EYES ON SPACE • LEVEL Z • 2



Summary

SKILL: MAIN IDEA AND DETAILS

Name _____

Instructions: Construct the correct hyphenated compound adjective to complete each sentence. Write the adjective on the line and circle the noun the adjective modifies.

average	based	close	dark	dish
down	energy	gathering	high	land
light	more	qualified	shaped	side
sized	up	upon	well	written

TELESCOPES: EYES ON SPACE • LEVEL 2 • 3

1. Astronomers realized that land-based telescopes will always have severe limitations.
2. Most radio telescopes are large _____ structures made of metal.
3. They saw the first _____ view of a comet hitting a planet.
4. It is difficult to make a _____ lens more than 10 centimeters in diameter.
5. She is a _____ worker than the rest of her department.
6. Some very _____ waves are blocked by Earth's atmosphere.
7. That is a _____ article published in the paper.
8. Most _____ radio telescopes have dishes that measure approximately 25 meters across.

SKILL: HYPHENATED COMPOUND ADJECTIVES

Name _____

Instructions: Read each sentence. Circle the word in each sentence that has an abbreviation equivalent. Write the abbreviation on the line below the sentence.

1. Doctor Smith used the telescope to see Saturn.

2. Mister Williams adjusted the focus.

3. The tripod was set at 3 meters high.

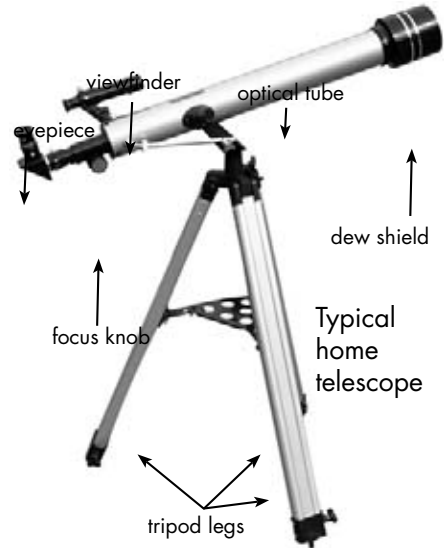
4. I got my first telescope on Monday, July 12th.

5. The mirrors in a telescope on Mt. Graham in Arizona are each 27 feet wide.

6. Since the observatory is 8 miles from my home, I have to ride the bus.

7. The optical tube on my telescope is 24 inches long.

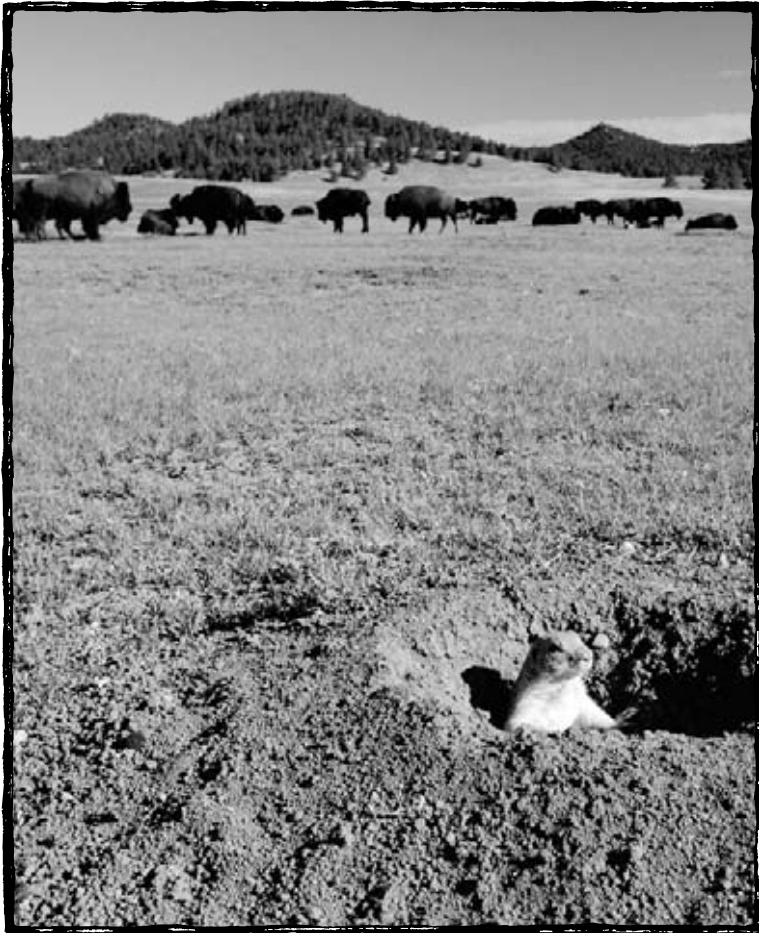
8. The meteoroids seemed to zip across the sky every 5 seconds.



Prairies Alive!

A Reading A-Z Level Z Leveled Reader

Word Count: 1,966



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LEVEL Z	
Fountas & Pinnell	V
Reading Recovery	29
DRA	N/A



Table of Contents

What Are Grasslands?	4
Three Types of North American Grasslands	6
The Importance of Fire	10
The Prairie Ecosystem	12
Preserving the Prairies	14
Plants of the Prairies	15
Animals of the Prairies	18
Glossary.....	23
Index	24

What Are Grasslands?



Grasslands in South America are called pampas.



Grasslands in Asia are called steppes.



Grasslands in South Africa are called veld.

Have you ever been on a ship far out at sea—or even in a boat in the middle of a large lake? In any direction you look, all you can see is water, right? Now imagine being in the middle of a sea of grass, surrounded by waves of green, golden, brown, and reddish grasses and multicolored flowers as far as the eye can see. This grassy sea is the home of hundreds of **species** of plants and animals. Different kinds of birds fly overhead, some swooping and diving for prey that live their lives mostly hidden among the grasses on the flat or gently rolling landscape.

This is what a large, natural grassland is like—it's not like turf in peoples' yards, which is mostly one color, 2-inches tall, and hiding not much more than insects. Not all grasslands are alike, either. Different kinds of grasslands are found in North and South America, Europe and Asia, Africa, and Australia—every continent on Earth except Antarctica. Grasslands usually grow in areas that get too much rain for deserts but not enough rain for forests.

The main kinds of plants in grasslands are grasses, of course. Did you know that not all grasses are the same? Hundreds of different species populate the world's grasslands. One thing that most grasses have in common is that they are tough, hardy plants that can survive fire, heat, freezing, **drought**, and **grazing**. Can you think of anything else that could survive all of that?

Grasses have roots that grow deep underground to find and take in water and **nutrients**. New plants can grow from these roots when the stems and leaves above ground die, such as when they are burned by fire or eaten by animals.

Do You Know?

The tallgrass prairie once covered over 140 million acres (56.7 million hectares) in North America. About 10 percent of this area remains.



Three Types of North American Grasslands

North American grasslands are known as prairies. The amount of rainfall and type of soil makes each prairie different. There are three main types—tallgrass, mixed-grass, and shortgrass prairies. I'll bet you can guess what the main difference is among the three. If you guessed the height of the grasses, you guessed right.

Tallgrass prairie

Let's start in the eastern part of North America's prairie region and travel west, as many European settlers did in the 1800s. The tallgrass prairie comes first, and it includes much of Illinois, Iowa, Minnesota, North and South Dakota, Nebraska, Kansas, Oklahoma, and Texas. In the tallgrass prairie, it rains 30 to 40 inches (76–102 cm) every year.

In the tallgrass prairie, some grasses, such as big bluestem and Indian grass, grow taller than the average human—to heights of 8 feet (2.4 m) or more. The roots of these grasses can grow even more—to depths of 9 feet (2.7 m). In a tallgrass prairie, the soil is deeper, darker, and richer in nutrients than the soil in other kinds of prairies. Can you imagine traveling by foot through a tallgrass prairie? It would be easy to get lost.



Pembrace Trail Preserve, Minnesota

Mixed-grass prairie

Now we move westward to the mixed-grass prairie, which is found in parts of North and South Dakota, Nebraska, Kansas, Oklahoma, and Texas. It gets between 15 and 25 inches (38–64 cm) of rain per year.



Mixed-grass native prairie, South Dakota

In the mixed-grass prairie, such grasses as little bluestem and

side-oats grama grow to heights of between 2 and 3 feet (61–91 cm). The soil in this kind of prairie is usually dark brown.

Shortgrass prairie

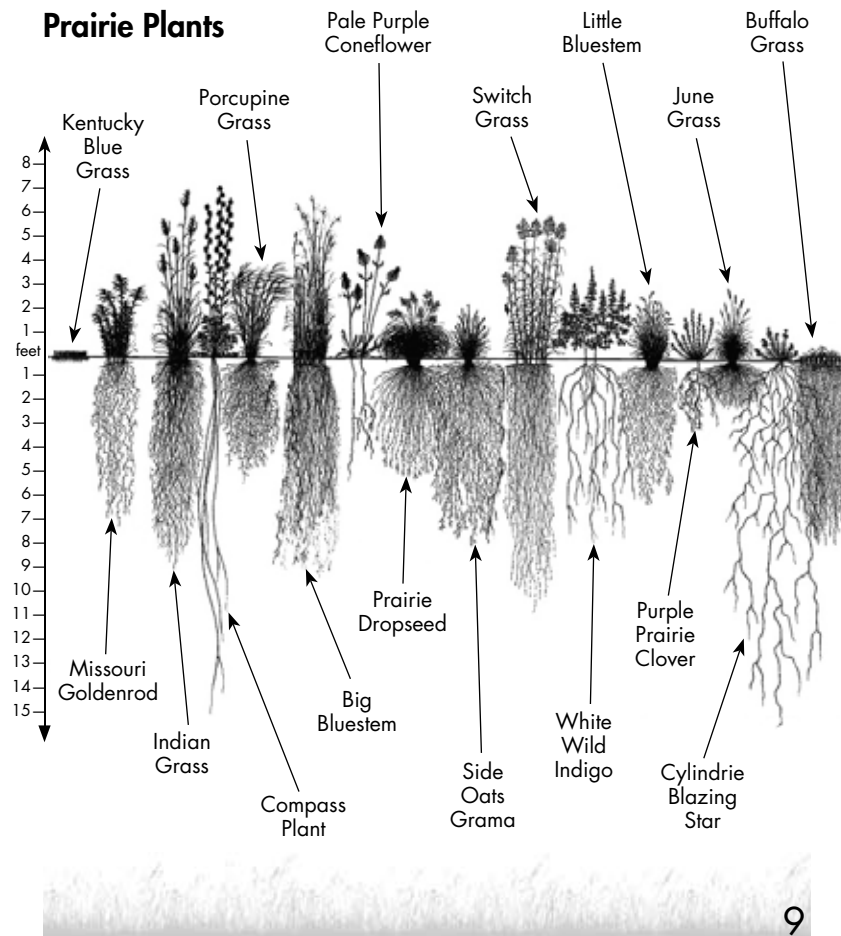
The shortgrass prairie, which lies just east of the Rocky Mountains, gets only about 10 inches (25 cm) of rain every year. This prairie spreads into



Shortgrass prairie, Montana

Montana, Wyoming, Colorado, New Mexico, and Texas. The shortgrass prairie gets little rain because the mountains create a “rain shadow” in this area. This means that warm, dry winds blowing down from the mountains make the area dry.

In the shortgrass prairie, most grasses, such as buffalo grass and bunch grass, grow to between 8 and 18 inches (20–46 cm) in height. The roots grow about 3 feet (91 cm) deep in the light brown soil.



Managers of prairies set special fires, known as “controlled burns,” to help prevent trees and shrubs from growing.

The Importance of Fire

Most things cannot survive fire—but a prairie can! In fact, fire actually helps a prairie thrive. This is because prairie grasses have deep roots that new stems can easily grow from. During a fire, the flames may reach a temperature greater than 400 degrees Fahrenheit (204°C), but the temperature below ground rises only a few degrees. So after the fire stops, the grass roots can quickly give rise to new stems. By contrast, if any young trees or shrubs are growing on the prairie, they will probably be killed by the flames. Were it not for fires, these trees and shrubs would continue to grow, and the prairie would turn into a forest.

Until the 1800s, fires occurred on the prairies when lightning struck the ground. Native American people, such as the Sioux, Pawnee, and Cheyenne, also set fire to the prairies. They sometimes set fire around a herd of bison (buffalo) to force the animals to run past a particular spot. Hunters would kill the bison, which would be used for food, clothing, and shelter. Native Americans also burned the prairie because the burnt plant material added nutrients to the soil when it decomposed.

When Americans of European ancestry moved into the prairie region in the 1800s, they usually put out any fires, thinking they were dangerous. Because of this, many parts of the prairie became forests.



Prairie Herds

Millions of bison (buffalo) once lived in huge herds on the prairies. However, the new settlers did not want these animals living where they wanted to build farms and towns. So they killed them in great numbers. Bison were easy to kill because instead of running away, they stood in circles surrounding and protecting their young. By 1890, only about 500 bison remained. Then, some people began breeding the remaining bison in zoos and on ranches. Today, about 200,000 bison are living in protected areas, such as Yellowstone National Park.

The Prairie Ecosystem

All the **interactions** of plants, animals, and nonliving things, including fire, make up the prairie **ecosystem**.

The prairie ecosystem has six main parts: 1) the Sun, 2) producers, 3) primary consumers, 4) secondary consumers, 5) decomposers, and 6) nonliving substances.

The Sun, with its light and heat, provides energy for everything else in the ecosystem. The Sun's energy flows through everything.

Producers are the grasses and other plants. They use energy from the Sun—along with water, carbon dioxide gas from the air, and nutrients from the soil—to make their own food.

Primary consumers in the prairie ecosystem are the animals that eat the plants, such as jackrabbits that eat grasses and clover. These animals, also called **herbivores**, get their nutrients and energy directly from plants.

Secondary consumers are the meat-eating animals, called **carnivores**, that eat the plant-eating animals. An example is a fox that eats jackrabbits.





Prairie Potholes

Areas in prairies where water is present for part or all of the year are called prairie wetlands. Wetlands that have water for only part of the year are known as prairie potholes. These areas are important resting and breeding places for ducks and other birds that migrate (travel long distances during spring and fall). Prairie potholes also take in rainwater like a sponge, helping to prevent flooding.

Decomposers in the prairie ecosystem are organisms that break down dead plants and animals into chemical substances in the soil. These organisms include **bacteria** and **fungi**, such as mushrooms. The chemical substances form nutrients that plants use to grow. These chemical substances and water are the nonliving parts of the prairie ecosystem.

Preserving the Prairies

In North America, few areas of natural prairie remain. Most prairies were changed into farms or cities long ago. However, some places still exist where you can get an idea of what it was like when the early settlers first saw the sea of grass. At these prairie preserves, scientists and volunteers—people like you—work together to restore prairies to their natural condition.



These cord grass seeds were collected to help restore the prairie.

To learn whether any prairies are near you, check with your state department of natural resources. Ask whether there are any tasks for which you can volunteer to help, such as collecting seeds or counting

birds. These activities are wonderful ways to learn about the great grasslands of North America.

Do You Know?

In the area where prairies are today, there was a warm, shallow ocean between about 440 million and 410 million years ago. Scientists know this from finding fossils and other signs of ancient sea animals in the region.

Plants of the Prairies

Following are a few examples of plants that can be found on prairies.

Grasses

Big Bluestem

Big bluestem is one of the tallest grasses on the tallgrass prairie, growing to a height of 8 feet (2.4 m) or more. It is blue only when the young shoots first come up in early summer. Later, the plant turns shades of red or brown. Big bluestem's flowers grow in long hairy spikelettes (clusters) that look like the three front toes of a bird's foot. That is why big bluestem is also known as "turkeyfoot" and "beardgrass."



Seed heads for little bluestem look fluffy.

Little Bluestem

Little bluestem usually grows in drier areas than its big "brother," big bluestem. It can reach a height of about 4 feet (1.2 m). Its flowers grow in short hairy spikelettes arranged in zigzag patterns at the top of its stems.



Flowers on side-oats grama give the prairie some reddish color.

Side-Oats Grama

The flowers of side-oats grama hang off to one side of thin flower stalks. The plant usually grows to a height of 32 inches (81 cm) in mixed-grass or shortgrass prairies. This and other types of grama grass were important **forage** plants for the bison that once roamed in large herds across the prairies.



Buffalo grass would make a great central Texas lawn.

Buffalo Grass

Buffalo grass is another grass that was an important forage plant for bison. This plant grows about 6 inches (15 cm) high. In the 1800s, settlers used slabs of sod formed by buffalo grass like bricks to make their houses.

Other Plants

Composites

Many prairie plants belong to the composite (sunflower) family. These plants have large “flowers” that are each made of many tiny flowers. The tiny flowers in the center, called disk flowers, are surrounded by a ring of other flowers, called ray flowers.



Blazing stars are composites with bright pink, red, or purple flowers that look like colorful shooting stars. The compass plant is a composite with large leaves, the edges of which always point in a north-south direction. Goldenrods have bright yellow clusters of flowers in late summer and fall.

Legumes

Many prairie plants belong to the legume (pea) family. These plants all have flowers with complicated shapes.



Prairie legumes (lih-GYOOMZ) include various kinds of clovers with white, yellow, red, or purple flowers. They also include wild indigos, which have white or cream-colored flowers. The stems of wild indigos contain a blue dye that was used by early settlers to color clothing.

Animals of the Prairies

A wide variety of animals live on prairies. Here are a few examples.

Grouse

Grouse are brown, chickenlike birds that live on the ground of prairies. They eat seeds, leaves, grains, berries, buds, and flowers. When a male grouse wants to attract a female, he dances, makes cooing sounds, and blows up a purple sac on his neck like a balloon. Grouse live in flocks called coveys.



This sharp-tailed grouse shows he merits the name.

Snakes

One of the largest prairie reptiles is the bullsnake, a brownish snake that can grow to a length of 8 feet (2.4 m). It slithers through the grass looking for **rodents**, birds, and eggs to eat. It also hisses loudly! Other prairie snakes include the prairie kingsnake, the massasauga (also called the timber rattlesnake), and the fox snake.



A bullsnake hisses loudly as a warning to stay away.

Prairie Dogs

Prairie dogs live in western prairies, but they are not dogs. They are rodents that bark like dogs! Prairie dogs live in groups of hundreds of animals called towns. They dig large systems of underground **burrows** where they run to hide when hawks, coyotes, or other enemies come near. These burrows can be 16 feet (5 m) deep.



The burrows of a prairie dog town have entrance holes surrounded by mounds of dirt.

Hawks

Several kinds of hawks fly over prairies during the day searching for rodents, songbirds, and other prey. (Their role as flying hunters is taken over at night by owls.) The northern harrier (also called the marsh hawk) stands about 2 feet (61 cm) tall. It glides low over the ground as it hunts, calling “kee kee kee.” The northern harrier can fly as fast as 40 miles (64 km) per hour.



A hawk and its chicks on a prairie nest

Coyotes and Foxes



A coyote mother with a squirrel she's caught.

Coyotes, sometimes called prairie wolves, are about as large as a medium-sized dog. They usually weigh between 20 and 50 pounds (9–23 kg). Coyotes eat rodents, rabbits, dead animals, and fruit. They make spooky-sounding howls that can be heard at night.



Swift foxes are one of the smallest foxes in North America.

Foxes are smaller than coyotes. They usually weigh between 8 and 15 pounds (4–7 kg). Like coyotes, foxes will eat just about anything they can catch. Both gray and red foxes can be found on prairies.

Pronghorn Antelope

The fastest animal in North America is the pronghorn antelope, a long-legged, plant-eating **mammal** that lives on the shortgrass prairie. The pronghorn can run as fast as 60 miles (96 km) per hour—that's above the speed limit on most highways! The pronghorn stands about 40 inches (102 cm) high at the shoulders. Males have two black horns with hooklike prongs.



A female, left, and male pronghorn antelope



Tallgrass Prairie Preserves

- **Flint Hills National Wildlife Refuge, Tallgrass Prairie National Preserve, Kansas**
<http://flinthills.fws.gov/>
<http://www.nps.gov/tapr/>
- **Goose Lake Prairie State Natural Area, Illinois**
<http://dnr.state.il.us/lands/landmgt/parks/i&m/east/goose/home.htm>
- **Living Prairie Museum, Manitoba (Canada)**
<http://www.winnipeg.ca/publicworks/naturalist/livingprairie/>
- **Tewaukon National Wildlife Refuge, North Dakota**
<http://www.fws.gov/tewaukon/>
- **Waubay National Wildlife Refuge, South Dakota**
<http://waubay.fws.gov/Shortgrass/Mixed-GrassPrairiePreserves>
- **Caddo and Lyndon B. Johnson National Grasslands, Texas**
http://www.fs.fed.us/r8/texas/recreation/caddo_lbj/caddo-lbj_gen_info.shtml
- **Comanche National Grassland, Colorado**
<http://www.fs.fed.us/r2/psicc/coma/>
- **National Bison Range, Montana**
<http://www.fws.gov/bisonrange/nbr/>
- **Prince Albert National Park, Saskatchewan (Canada)**
http://www.pc.gc.ca/pn-np/sk/princealbert/index_e.asp
- **Wichita Mountains Wildlife Refuge, Oklahoma**
<http://www.fws.gov/southwest/refuges/oklahoma/wichitamountains/>

Glossary

bacteria (<i>n.</i>)	one-celled organisms that sometimes cause infections and disease (p. 13)
burrows (<i>n.</i>)	holes or tunnels dug in the ground by an animal for use as a shelter (p. 19)
carnivores (<i>n.</i>)	animals that eat mainly meat (p. 12)
drought (<i>n.</i>)	a long period of time with very little rain (p. 5)
ecosystem (<i>n.</i>)	a biological community of organisms together with their habitat (p. 12)
forage (<i>n.</i>)	hay, grain, grass, or other food for plant-eating animals (p. 16)
fungi (<i>n.</i>)	small organisms that grow on organic material and produce spores (p. 13)
grazing (<i>v.</i>)	feeding on plants or another stationary food source (p. 5)
herbivores (<i>n.</i>)	animals that eat only plants (p. 12)
interactions (<i>n.</i>)	the cause-and-effect relationships between living and non-living things (p. 12)
mammal (<i>n.</i>)	a warm-blooded animal that has hair or fur, nurses its young, and has babies that are born live (p. 21)
nutrients (<i>n.</i>)	substances in food or soil that organisms need to live, stay healthy, and grow (p. 5)

rodents (<i>n.</i>)	small mammals such as mice or rats that have large gnawing teeth that continue to grow throughout the animal's life (p. 18)
species (<i>n.</i>)	a group of animals that are similar to one another and may have babies with each other (p. 4)

Index

bacteria, 13	indigos, 17
bamboo, 7, 15, 16	legumes, 17
big bluestem, 11, 16	little bluestem, 8, 16
bison, 11, 16	massasauga, 18
blazing stars, 17	northern harrier, 19
buffalo grass, 9, 16	prairie dogs, 19
carbon dioxide, 12	prairie kingsnake, 18
clover, 12, 17	preserves, 14
compass plant, 17	prairies,
composites, 17	mixed-grass, 6, 8, 16
coyotes, 20	shortgrass, 9, 16, 21
ecosystem, 12, 13	tallgrass, 6, 7
fire, 5, 10–12	pronghorn antelope, 21
fox snake, 18	Rocky Mountains, 8
fox, 12, 20	side-oats grama, 8, 16
fungi, 13	soil, 6–9, 11–13
grouse, 18	

Name _____

Instructions: In the first box, write what you already know about prairies. In the second box, write what you would like to know about them. After you finish reading, fill in the third box with what you learned from reading the book, and the fourth box with what you still want to know.



K: What I Know



W: What I Want to Know

L: What I Learned

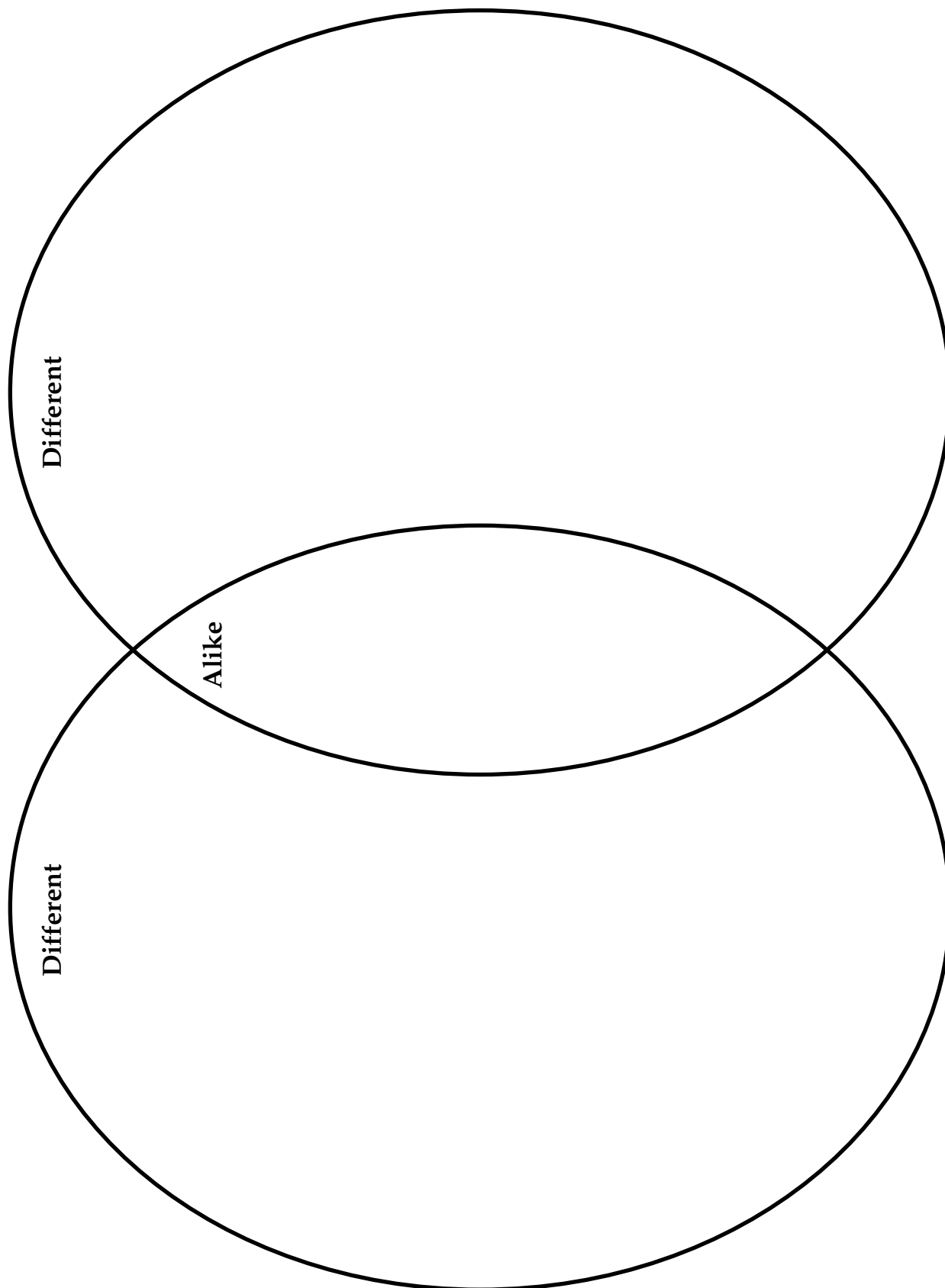
S: What I Still Want to Know

Name _____

Instructions: Use the Venn diagram to compare and contrast two animals found on prairies.

Topic: _____

Topic: _____



Name _____

Instructions: Read the sentences below and decide whether they contain dashes or hyphens. Then write *D* for *dash* or *H* for *hyphen* on the short line to the left of the sentence. If the sentence does contain a dash, on the lines below the sentence, explain how it is used (to indicate a break, to clarify information, or to add a thought).

1. _____ Have you ever been on a ship far out at sea—or even on a boat in the middle of a large lake?

2. _____ This is what a large, natural grassland is like—it's not like turf in peoples' yards.

3. _____ Little bluestem and side-oats grama grow to heights of between 2 and 3 feet.

4. _____ Bluestem and Indian grass grow taller than the average human—to heights of 8 feet or more.

5. _____ The roots of these grasses can grow even more—to depths of 9 feet.

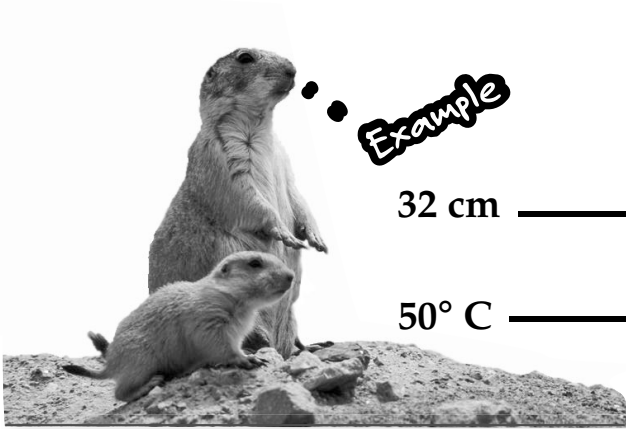
6. _____ Its flowers grow in short, hairy spikelettes arranged in zigzag patterns at the top of its stems.

7. _____ The compass plant is a composite with large leaves, the edges of which always point in a north-south direction.

8. _____ The pronghorn antelope is a long-legged, plant-eating mammal that lives on the shortgrass prairie.

Name _____

Instructions: Write the words next to each example to show how you would read the numbers and symbols aloud.



32 cm → thirty-two centimeters

50° C → fifty degrees Celsius

1. 102 cm _____

2. 50 lbs _____

3. 64 km _____

4. 1.2 m _____

5. 400°F _____

6. 16 ft _____

7. 204°C _____

8. 10% _____

9. 20–46 cm _____

10. 8 and 18 in _____

The Mystery of King Tut

A Reading A-Z Level Z Leveled Reader

Word Count: 2,391



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The Mystery of King Tut



Written by David Dreier

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The Mystery of King Tut



King Tut's
sarcophagus

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Front and back cover: The front and back of King Tutankhamun's funeral mask, one of the treasures found in his tomb

Table of Contents: A fragment from a column at Amarna showing Queen Nefertiti, who was probably Tut's stepmother

The Mystery of King Tut
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Correlation

LEVEL Z	
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Table of Contents

Finding Tut	4
King Tut's Homeland	5
King Tut's Family	7
The Boy Pharaoh	11
End of a Dynasty	14
King Tut's Tomb	16
The Suspects	18
The Body	20
Mystery Solved?.....	22
Glossary.....	23

Finding Tut

In 1922, a British **archaeologist** (AR-kee-OLL-oh-gist) made a fantastic discovery in the country of Egypt. He found the tomb of Tutankhamun (toot-an-KAH-muhn), better known as King Tut. Tut ruled ancient Egypt more than 3,300 years ago, becoming **pharaoh** (FARE-oh) at the age of nine. He ruled less than a decade before dying suddenly at about age 18. Since the opening of Tut's coffin more than 80 years ago, many have wondered how and why the young king died.



What Tut might have looked like, with his funeral mask in background

Just like detectives, archaeologists try to solve mysteries by looking at the evidence and by asking questions. Where did Tut live? What was his life like? Who were his family and friends? Did he have enemies? Answering questions like these may help solve the ultimate question: Did King Tut die of natural causes—or was the young pharaoh murdered?

King Tut's Homeland

Ancient Egypt was ruled for about 3,000 years by a series of 30 **dynasties** (ruling families). Historians group the first 20 dynasties into historical periods called the Early Dynastic Period, the Old Kingdom, the Middle Kingdom, and the New Kingdom.

King Tutankhamun was a member of the 18th Dynasty, the first ruling family of the New Kingdom, which began around 1540 BC, almost 200 years before Tut was even born.

In ancient Egypt, religious belief was an important part of life. Egyptians at that time worshiped many different **deities**—gods and goddesses. To fully understand the mystery surrounding King Tut, one must learn the history behind this religious belief.



Two of Egypt's most important gods at the beginning of the New Kingdom were Ra (RAH) and Amun (AH-muhn). Ra was believed to live within the sun. In images, he was often depicted as a falcon. Amun was usually depicted as a man with a tall crown.

During the early part of the New Kingdom, however, some Egyptians began worshiping the sun in a different way. Instead of seeing the sun as Ra's home, they saw the sun as a god itself. They called this new god Aten (AH-tuhn) and depicted him as a golden disk with rays of light reaching toward Earth.

As Aten's power as a god grew, other gods such as Ra and Amun were worshipped less and less. But Egypt was still a land of religious freedom, and to most people, this newcomer, Aten, was just another god among many. He did not pose a threat to their religious beliefs until a young man named Amenhotep (Ah-muhn-HO-tep) IV—Tut's father—became pharaoh.



Amenhotep IV

Gods on the Job

Out of hundreds of deities, people usually devoted themselves to a small group of major and minor gods and goddesses. One reason Egyptians worshiped particular deities was to get help with their careers.

Thoth, god of writing and knowledge, was worshiped by many scribes in ancient Egypt.

Seshat, goddess of writing and measurement, would have been a better choice than Thoth for ancient astronomers, architects, and mathematicians.

Ptah, god of craftspeople, was worshiped by artisans of all kinds, such as those who painted tomb walls or those who made statues.

Anubis, god of embalmers, was believed to be a powerful friend of those who made their living by preparing the dead for the afterlife.

King Tut's Family

Amenhotep IV began his rule in 1353 BC. He was an odd-looking man with a long face, large lips, and a protruding belly. Amenhotep had been raised in the new Aten religion and was a true believer. He saw Aten as a universal god—a god of all the people in the world, not just Egyptians.

The pharaoh believed Aten, the universal sun god, created the world at the beginning of time, ruled over it alone, and continued to give life to

the world through his bright rays of light. Thus, Amenhotep IV has been called the world's first **monotheist**, someone who believes in a single, all-powerful god.

After about five years, the new pharaoh took a drastic step. He began a religious **revolution**, a sudden and complete change in the official religion of Egypt. He declared that Egyptians could only worship Aten. He changed his name to Akhenaten (ahk-NAH-tuhn), which means "He Who Serves Aten." Akhenaten closed and tried to destroy temples that worshiped the other gods.

Akhenaten's actions upset people who were used to worshiping many gods and angered the priests of the old gods. Taking away religious freedom sometimes moves people to violence. In various parts of Egypt, people tried to stop the destruction of their temples, but the pharaoh's military was able to control them.

In addition to destroying temples, Akhenaten also ordered a new capital city built. He moved the capital away from Thebes and called the new city Akhetaten (ahk-TAH-tun), which means "Horizon of Aten." Today this area is called Amarna, and Akhenaten's revolution is called the Amarna Revolution.

Many people remained angry throughout Akhenaten's reign and perhaps through the reign of his son. Due to the drastic religious changes initiated by his father, Tut inherited enemies. His father's revolutionary actions undoubtedly created some of the mystery surrounding the reign and death of King Tut.



Akhenaten and Nefertiti, possibly Tut's stepmother with their three children in a carving from a temple at Amarna

But was anyone angry enough to commit murder?

It was in this new capital of Egypt that King Tut was born in about 1342 BC. No one knows for sure who his parents were, but most historians feel his father was Akhenaten and his mother was Lady Kiya, one of Akhenaten's wives. The boy was named Tutankhaten, meaning "the Living Image of Aten."

Akhenaten died in 1336 BC after 17 years of rule. What happened next is as puzzling as who Tut's parents were. There were apparently two rulers who had very brief reigns after Akhenaten's death.

One of them may have been a brother of Tutankhaten. The other may have been a queen named Nefertiti. No one knows for sure. In any case, three or four years after Akhenaten's death, the throne of Egypt was again empty so nine-year-old Tutankhaten became pharaoh.



Queen Nefertiti

Except for Cleopatra, no other queen of Egypt is as well known as Nefertiti (neh-fer-TEE-tee). She was the favorite wife of Pharaoh Akhenaten. Nefertiti became the stepmother of the young Prince Tutankhaten (later Tutankhamun) when his mother died. Nefertiti died in her early 30s.

The Boy Pharaoh

Before and during his reign, Tut lived the life of the wealthy. He wore jewelry, linen clothes, perfumed oils, and makeup. Archaeologists found all these items in his tomb. He would have been expected to hunt, usually with a bow and from a chariot, and he might have otherwise passed the time playing games as children do everywhere. Chariots, nearly 50 bows, and senet (a board game) were placed in his tomb for his use in the afterlife.



King Tutankhaten

During his reign, Tutankhaten married his half-sister Ankhesenpaaten (AHNK-eh-suhn-PAH-tuhn), a daughter of Nefertiti.

Ankhesenpaaten's name means "She Lives Through Aten."

Marriages between close relatives were common in Egyptian royal families so the family could keep their lands and the power that came with them. The couple had two children, but neither lived.



Queen
Ankhesenpaaten

King Tut had several servants in the court. One personal attendant, Tutu, had served Tut's family for years, since his grandfather had been king. Other servants, some even younger than King Tut, would help him with even the smallest tasks. For example, he had a cup bearer, whose job was to make sure everyone's drinking cups stayed full, especially the young king's.

Because the pharaoh was so young, the military and political work of the royal court was mostly carried out by others—two men in particular. One of them was an aging military officer and adviser named Ay. The other was a great army general named Horemheb (HOR-ehm-heb). Although they had both served Akhenaten, they strongly disliked his religious reforms. The two hoped King Tut would bring back the old ways of worshiping.



Wall painting
of Horemheb,
an army
general and
adviser to
King Tut

Horemheb and Ay wanted Tut to end the worship of Aten. They especially wanted Tut to return Amun to his former glory as chief god. The king did so, and changed his name from Tutankhaten to Tutankhamun, “the Living Image of Amun.” The queen also took a new name, Ankhesenamun (AHNK-eh-suhn-AH-muhn). Historians are certain that Ay and Horemheb were the main forces behind the changes that took place during King Tut’s reign. Because he was so young, they believe the pharaoh did as he was told.

As part of a return to the old ways, the royal court moved back to Thebes. The once thriving city of Amarna, devoted to the god Aten, was left to decay in the Egyptian sun.



Remains of Akhenaten’s city of Akhetaten built around 1348 BC

End of a Dynasty

In 1322 BC, when he was about 18 years old, King Tutankhamun died. How he died was not recorded and remains a mystery. The young pharaoh was **mummified** and then buried in a tomb in the Valley of the Kings, a large royal cemetery near the city of Thebes.

Because Tut had no living children, the throne of Egypt was open to someone who was not a member of the royal family. Ay, because of his long experience in the court, became the new pharaoh and married Tut’s widow. After ruling for just four years, Ay died in 1319 BC. Horemheb then became pharaoh.



Do You Know?

Just like a person today might have a first, middle, and last name, pharaohs had more than one name. They had one name at birth, and when they became pharaohs, they were given other names. Often these names appeared inside an oval known as a cartouche (car-TOOSH). Ancient Egyptians believed names were very powerful. They thought that by writing a person’s name on something, then breaking it, they could hurt or even kill that person.



Many mummies of pharaohs were found in the Valley of the Kings.

To show his devotion to Amun, Horemheb ordered the destruction of everything connected with the Aten religion and Akhenaten. In Amarna, his men demolished the abandoned temples of Aten. They also smashed statues of Akhenaten and his family—including King Tut—and gouged their names and faces from wall art. Later, workers removed the blocks of stone with the wall art from the buildings in the city and used them for construction projects in Hermopolis, a city on the other side of the Nile River near Amarna.

Horemheb ruled for 27 years, dying in 1292 BC. With his death, the 18th Dynasty ended. Later, Ramses II, a great pharaoh of the 19th Dynasty who had served with Horemheb in the Egyptian army, completed the destruction of Amarna. The shattered remnants of Akhenaten's once-splendid capital were covered by drifting sand and forgotten.

King Tut's Tomb

In the 1800s, many archaeologists went to Egypt to study Egyptian picture writing, called **hieroglyphics** (hy-ur-uh-GLIF-iks), on walls and monuments. From the writing, archaeologists



Treasure from Tut's tomb

learned a lot about the pharaohs of Egypt. They learned that the tombs of pharaohs would be filled with all the things a person might need in the

afterlife. Expecting to find riches, they found the pharaohs' tombs, but were disappointed. Every tomb had been robbed of its valuable treasures by thieves long ago. By the early 1900s, archaeologists believed they had discovered the tomb of every known pharaoh except one: Tutankhamun.

A British archaeologist, Howard Carter, was determined to find it. Carter searched for Tut's tomb for more than five years with no success. In 1922, he persuaded the man paying for the search, Lord Carnarvon, to pay him for one more season.

Luckily for the world, his persistence paid off. Later that year, Carter found Tut's tomb in almost undisturbed condition. It contained a wealth of **artifacts**, including thrones, jewelry, weapons, and statues. The mummy of Tutankhamun, covered with a large gold mask, lay within three nested coffins. The innermost coffin was made of about 242 pounds (110 kilograms) of pure gold. Carter's discovery created a sensation, and Tut became the most famous pharaoh in history.



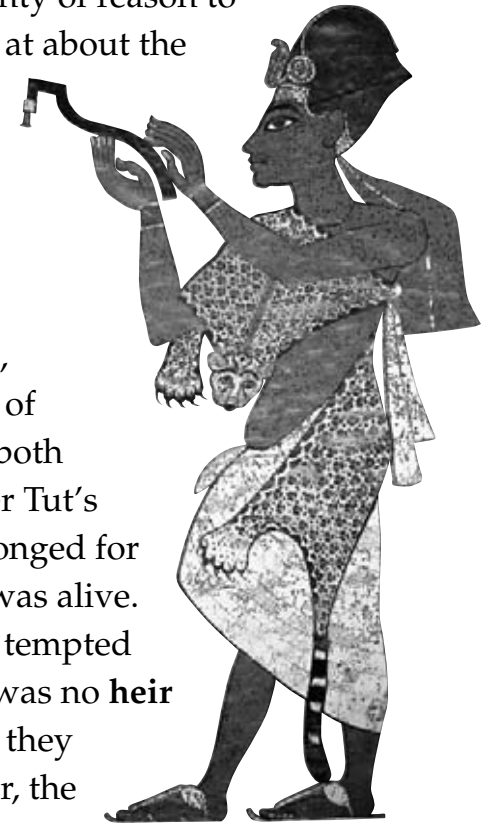
The Mummy's Curse

In November 1922, Lord Carnarvon attended the opening of Tut's tomb. A few months later, he died from an infected mosquito bite. Soon after that, two other people who had entered the tomb died prematurely. These deaths gave rise to the legend of "The Mummy's Curse." The legend said that anyone who dared to disturb Tut's resting place was doomed. However, most people associated with the tomb were not affected by the curse. In fact, Howard Carter, a real life Indiana Jones, the man who should have been the most cursed of all, lived until the age of 66.

The Suspects

Early death was nothing unusual in ancient times. The average life span in ancient Egypt was about 30 years, and many people didn't live that long. Still, there is plenty of reason to believe that King Tut, at about the age of 18, may have been the victim of murder. Several people had reasons to kill him.

Ay and Horemheb, who controlled many of King Tut's decisions, both became pharaohs after Tut's death. Perhaps they longed for the throne while Tut was alive. They must have been tempted by the fact that there was no **heir** to the throne. Thus, if they wanted to seize power, the time to do it was before Tut had children who lived, or before he reached adulthood and pushed the two men aside. Some archaeologists say that Ay and Horemheb may have joined forces to kill Tut, perhaps with poison.



A wall painting of Ay found in Tut's tomb

Ay and Horemheb are the most likely suspects, but they are not the only ones. Some researchers have identified two of Tut's servants as possible murderers: the cupbearer and his personal attendant, Tutu. They were among the very few people permitted to enter the king's bedroom. Either man could have murdered the pharaoh, perhaps by striking his head with a heavy object while he slept.

Horemheb included an inscription on a statue of himself, found in his tomb, that claims he is innocent of Tut's death. Even though he destroyed the city that Tut's father built, Horemheb insists he always served the young pharaoh faithfully, then warns, "Egyptian brothers, don't ever forget what foreigners did to our King Tutankhamun." This note points to a foreigner.



A queen's servant pours a drink for her as another servant attends to other needs.

The servant Tutu was of foreign origin, and he was said to be a rather suspicious character. A group of amateur archaeologists in Egypt contends that Tutu was spying for an Egyptian **vassal state**, a country conquered and then ruled by Egypt. They think Tutu could have murdered both Tut and Akhenaten when they discovered what he was doing.

The Body

For many years, people have theorized that Tut was indeed killed by a blow to the head. They based that belief on **X-ray** studies of the pharaoh's mummy made in 1968 and in 1978. The X-rays showed damage to the back of Tut's skull. Experts said the damage was strong evidence that Tut had been hit on the back of the head with a heavy object. But was that really true?



Dr. Zahi Hawass with Tut before the mummy enters the CT scanner

In 2005, researchers in Cairo, Egypt, decided to answer the question once and for all. The group was led by a top Egyptian archaeologist, Zahi Hawass. The researchers studied King Tut's mummy with an advanced X-ray technique called **CT (CAT) scanning**. A CT scanner takes numerous X-rays of an object from different angles. The X-ray information is fed to a computer, which uses the information to produce images. CT images are much more detailed than ones made with regular X-ray machines.



Scientists reveal the face of King Tut's mummy.

Hawass announced that King Tutankhamun definitely did not die from a blow to the head. He said the skull damage, revealed by the earlier X-ray studies, had been caused in other ways, after Tut's death. In fact, the injuries may have happened during mummification when King Tut was **embalmed**.

The mystery doesn't stop there. The researchers did find new evidence of what might have killed Tut. The CT scans showed that the king had suffered a broken leg. Hawass said the boy may have developed an infection from the injury and died a few days later.

Mystery Solved?

So, is that the end of the mystery? Maybe not. Some members of Hawass's group said the broken leg might have also happened when Tut was being embalmed. Others felt certain that Howard Carter's team caused the break when they removed Tut's body from its inner coffin. However, Hawass agreed that it's still possible that Tut was poisoned. But if that's



Carter's team removes Tut from his tomb.

what happened, we'll probably never find proof of it, much less find out who did it. Needless to say, there were many people who had motives for murder. Thus, the mystery surrounding King Tut's death continues. We may never know what really happened.



Glossary

archaeologist (<i>n.</i>)	someone who studies objects from ancient times (p. 4)
artifacts (<i>n.</i>)	objects created by people of a particular period (p. 17)
CT scanning (<i>n.</i>)	the use of computerized tomography machines to create three-dimensional images of human bone and soft tissue (p. 21)
deities (<i>n.</i>)	gods and goddesses (p. 5)
dynasties (<i>n.</i>)	families whose members rule a country for generations (p. 5)
embalmed (<i>adj.</i>)	filled with chemicals to prevent decay (p. 21)
heir (<i>n.</i>)	someone who will inherit the property and wealth of another, usually a family member (p. 18)
hieroglyphics (<i>n.</i>)	the ancient Egyptian system of writing using pictures (p. 16)
monotheist (<i>n.</i>)	person who believes in one god (p. 8)

mummified (<i>adj.</i>)	embalmed and wrapped in burial cloth (p. 14)
pharaoh (<i>n.</i>)	a king in ancient Egypt (p. 4)
revolution (<i>n.</i>)	a sudden, major change in the way things are, often brought about with violence, such as overthrowing a government (p. 8)
vassal state (<i>n.</i>)	a place that has been defeated and partly taken over by another government (p. 20)
X-ray (<i>n.</i>)	an energy beam capable of creating an image of many substances, especially bone (p. 20)

Examples of Egyptian hieroglyphics from the Temple of Amun

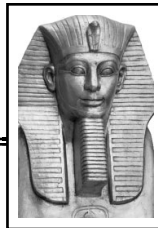


Name _____

INSTRUCTIONS: Write the main idea and supporting details for the section titled "King Tut's Tomb."
Then write a summary for the section, using the main idea and details you've already gathered.

Main Idea	Details

THE MYSTERY OF KING TUT • LEVEL Z • 1



Summary

--

SKILL: MAIN IDEA AND DETAILS/SUMMARY

Name _____

INSTRUCTIONS: Read the sentences below. Then identify the *independent clause*, the *dependent clause*, and the *conjunction* in each sentence. Write them on the lines provided.

- ① He did not pose a threat to their religious beliefs until a young man named Amenhotep IV became pharaoh.

Independent clause: _____

Dependent clause: _____

Conjunction: _____

- ② After about five years, the new pharaoh took a drastic step.

Independent clause: _____

Dependent clause: _____

Conjunction: _____

- ③ During the early part of the New Kingdom, some Egyptians began worshipping the sun in a different way.

Independent clause: _____

Dependent clause: _____

Conjunction: _____

- ④ Amenhotep IV died in 1336 BC after 17 years of rule.

Independent clause: _____

Dependent clause: _____

Conjunction: _____

- ⑤ Nefertiti became the stepmother of the young Prince Tutankhaten when his mother died.

Independent clause: _____

Dependent clause: _____

Conjunction: _____

- ⑥ During his reign, Tutankhaten married his half-sister Ankhesenpaaten.

Independent clause: _____

Dependent clause: _____

Conjunction: _____

Name _____

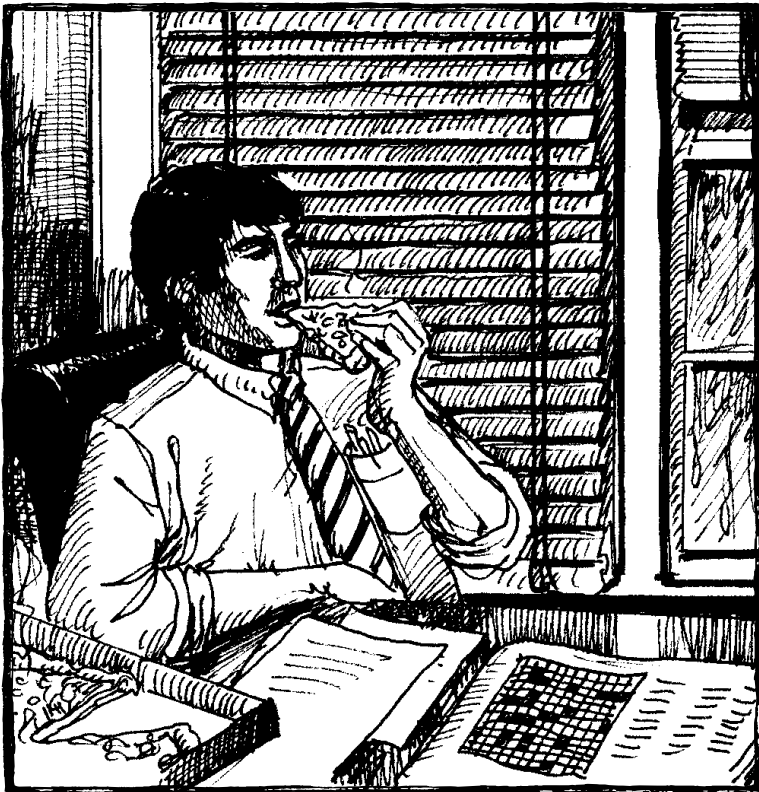
INSTRUCTIONS: Use your book to find all of the past-tense irregular verbs that the author used in sections 1 through 3: "Finding Tut," "Tut's Homeland," and "Tut's Family." Write all of the past-tense irregular verbs in the left-hand box below, and then write all of their present-tense matches in the right-hand box.

Past-Tense Verbs	Present-Tense Verbs
Section 1:	
Section 2:	
Section 3:	

Word Smith, Private I "Rhyme Crime"

A Reading A-Z Level Z Leveled Reader

Word Count: 2,895

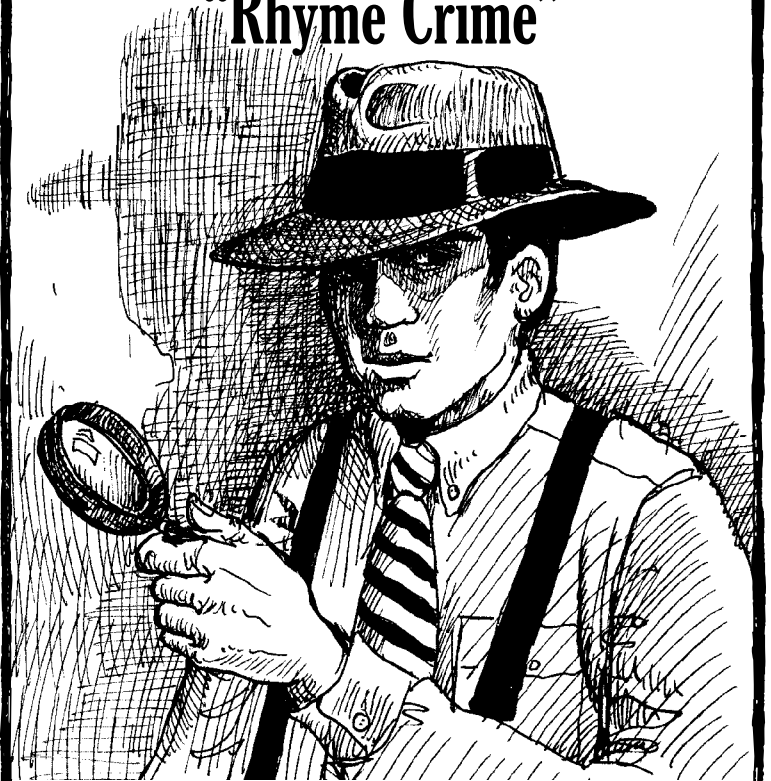



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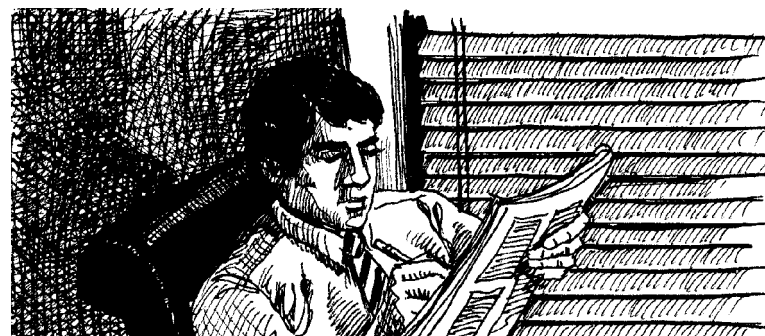
LEVEL Z	
Fountas & Pinnell	V
Reading Recovery	29
DRA	N/A



The sound of rain pounding on my office window pane filled the February room with gloom. It was noon. I was munching lunch, noting that I had made some rhymes when I would rather have been out solving crimes. My name is Smith, Word Smith. I'm a private detective—a private eye. Actually, I'm more of a private *I* since I specialize in cases involving the 26 letters of the alphabet and all forms of the words and phrases they form.

I figured that with all the wet weather we were having, even the people who break the rules of grammar in their everyday speech were staying at home. So, I took another bite of p-i-z-z-a and went back to the daily crossword puzzle.

"Number four down. A seven-letter word meaning, 'the same.'" From my previous answers, I knew this one started with an S. It was right there on the tip of my tongue, so I spit it out: "sausage"—the spicy kind. Luckily, it landed in a dark and dim place near the trash.



"Yuck. I won't order sausage pizza from Antonio's again." Then I wrote down the correct answer in the crossword, "**synonym**," and moved on to the next clue. That's when the door opened and in walked a bespectacled, bow-tied man wearing a blue suit.

"My name is Ben Brannoor. I'm the proprietor of a greeting-card store."

"Nice **scansion**," I said, approvingly. "Six syllables per rhyme."

"Ah, you are indeed Word Smith."



"And by your accent I can tell you are British, in which case the umbrella you're shaking out on my freshly waxed floors would be called a bumbershoot." (#3 Across in yesterday's crossword.) "But since I admire the **alliteration** of your name, dress, accent, and accessories—everything beginning with the letter *B*—I forgive you. Now what can I do for you?"

Ben Brannoor explained that Valentine's Day, which was coming up, was the biggest holiday of the year for the greeting-card business. But customers were leaving his store empty-handed. Why? Someone or something had taken the rhyme out of all the greeting cards. All that were left were plain sentences! Where had the rhymes gone?

"Look at this one," he said. "It is usually my number one seller. Now I may as well store it in the cellar."

I examined the cream-colored card with gold-embossed lettering. The cover showed a bouquet of flowers inside a heart. While I was looking at this beautiful card, a lump of sentimental joy welled up in my throat, unless that was a reaction to the sausage I'd just eaten. I opened the card and read the poem inside:

"Roses are red. Violets are blue.
If I had ten dollars, I'd spend it on *my pet salamander*."

"Horridly *unromantic*, isn't it?" Ben cried.

"Maybe it's a Valentine's Day card for an amphibian lover," I suggested.

"The last word in that poem is supposed to be 'you,' and you know it." He thrust another card toward me, which I read, dutifully.

"It's Valentine's Day, dear. My heart is full of love. It's true we fit together. Like a hand in a *bowl of oatmeal*."

"Glove! Glove is what that poem is going for," said Ben, so exasperated his bow tie untied.



"True, it is an odd poem," I concluded, "And maybe a bit gross, but not illegal."

"That's exactly what the bobbies said when they came to investigate."

I knew that bobbies, another British word beginning with a B, is a synonym for police (#12 down, the day-before-yesterday's crossword).

"The police said they couldn't do anything about the nonrhyming cards, because technically nothing had been stolen; the cards were still on their racks," Ben added. "I suspect some type of **linguistic** foul play is at work."

Was there a case here? Could rhymes really disappear? Or was this just some lazy greeting-card writers getting away with word-murder? And how could something called "play" be considered work? As was my habit when lost in thought, which I much prefer to being lost in than the woods at night, or lost in downtown Metropolis at any time, I went to squint through the slats of the 1940s Venetian blinds I had installed in my office.

I gazed across the avenue at the billboard advertising my favorite candy, with its famous rhyming slogan:

"When you're feeling low this can't be beat.
Reach for a Choco-Ball. It's so yummy to *smack*
with a five-iron."



Huh? Something smelled fishy, and it wasn't my day-old tuna sandwich. Then I noticed a stream of angry people leaving the theater down the block. It was just 3 p.m.; the Wednesday matinee of the hit musical comedy *Young Love Is Old School* shouldn't let out for another hour. Ben and I went down to see what was up.

A crowd of well-dressed women milled about the theater. "Why is everyone leaving the show so early?" I asked one of the patrons, **rhetorically**. "You didn't pay good money to come into the city to see an understudy in the role who wasn't up to your expectations?"

"No, all the leads were performing today, and in fine voice, too," replied the patron, ironically named Mrs. Rhett Orically.



"So, what was the problem?"

"Besides the director not reeling in the overacting actors? It was the song lyrics! They didn't rhyme."

"Ah-ha!" I said, noting the **palindrome**. "Ah-ha!"

Mrs. Rhett Orically continued. "I have the cast album and saw the original show in London—so I know from the lyrics! In the first act, Hiram Hornswoggle, the dashing young pharmacist vows eternal love for Hermione Hillybottom, the spunky, young animal rights activist who, on an undercover assignment, works the drugstore's cosmetics counter. But instead of singing, 'The full moon in June makes me want to swoon,' he crooned, 'The full moon in *October* makes me want to *break out in an itchy rash that can't be treated with antibiotics*.' Terrible. And painful. We didn't want to sit through that. Why, the image is frightful. Now, if you'll excuse me, I have to meet up with my group for some caloric cake and coffee before we take the bus back to Ketchum."

First, greeting cards, then advertising slogans, and now song lyrics . . . Ben Brannoor was right: Someone *was* stealing all the rhymes and replacing them with un-rhymes. But who could be so evil, so dastardly? I was drawing a blank, and not just blank verse.

Ben and I returned to my office. That's when it hit me like a ton of bricks! A truckload of dirt! A pound of pennies! Well, actually it was more like one brick, thrown through the window, with a note attached.

"Occupational hazard," I explained. "Being a film-noir-style private investigator, I lose a lot of windows this way."

"Let me read the note," said Ben.

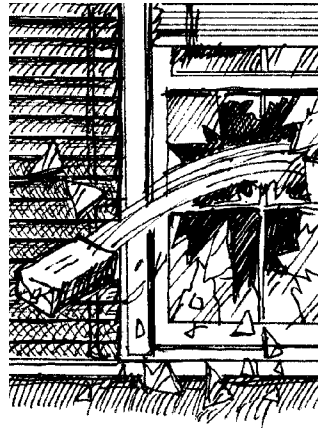
"Okay, but don't forget that the note was addressed to me."

Ben read, "If you want the rhymes back and then some/You will have to pay my ransom."

"Me," I said.

"Of course you, the note was addressed to you."

"No, the word 'me' is missing from the second line of the note. It should say 'pay *me* my ransom.' Any decent poet who can tell his iambic from his pentameter would hear that the second line needs one more syllable to have a musical **cadence**.



Now who could that 'me' be? Who would be so overconfident that they would misplace their 'me' when it mattered?"

I took the note from Ben, read it again, and immediately sang out, "E.E. Cuning is 'me'!"

"What?" said Ben, startled by my outburst. "But . . . you're Word Smith. It says so right on the glass of your office door. I can see it from here."

"That you can, though from my vantage point, it reads, 'rtim2 broW.' And true, I'm he. Or rather, I am me, but the poet E.E. Cuning, or as she writes it, all lowercase, 'e.e. cuning,' is the note writer who needed a 'me.'"



I explained to Ben that e.e., which stood for Eleanor Elizabeth, not extraordinary ego, which is what you must have to refer to yourself only by your initials, was once a successful poet. She broke onto the poetry scene with daring poems that never used commas or capital letters. The beatniks thought she was “out-of-sight” and the rappers thought she was “da bomb,” though English teachers thought she could use extra homework on punctuation. e.e. became the darling of the poetry circuit. She even hosted her own TV show, “For Better or Verse.”



But she got too famous too fast. She couldn't handle the pressure of constantly coming up with pithy witticisms and witty pithicisms, and her skyrocketing career plummeted as quickly as it took off—thanks to me. Back when I was on the Grammar Police, I caught her passing off bad rhymes, such as “oven” with “nothin’,” and her poetic license was revoked.

“The last I heard, she was writing silly bumper stickers.”

“Ah, so she must need money!” said Ben. “That’s why she did it. I wonder how much is the ransom? The note didn’t say.”

Just then, another brick with another note crashed through another window.

“You had to ask?” I grumbled. This note said, “I’m not doing it for money. I’m doing it to prove my domination of all things poetic. Meet me at the Synonym Bun Cafe tonight for the Poetry Triathlon.”

So that was her plan! She would use all the stolen rhymes to help her win the biggest event in the world of professional poetry! All the superstars of poetry would be there: Joyce Killjoy, Edgar Allan Woe, and Tanka, the Japanese **haiku** expert. Dr. Snooze, the beloved author of rhyming bedtime stories, would be the judge.

We got to the cafe shortly before 8 p.m. The place was in an uproar. The only poet on the main stage was e.e. cummings! Joyce Kilmer had suffered a mysterious accident in which she fell out of a tree. Edgar Allan Poe called to say he was too afraid to leave his house because a crazy black bird kept knocking at his door. Tanka sent a note, in the form of a 5-7-5 haiku:

"I must send regrets.
Cannot attend the contest.
Too ill to travel."

All of the all-star poets were no shows. Coincidences? I don't think so. I knew e.e. was behind this, so I stepped forward.

"May I compete?" I asked.



"Well, I don't know. Serious poets usually dress in all-black. You look more like a member of a game-show audience," Dr. Snooze observed, "but I guess we can overlook that. What do you say, e.e.?"

"Me against the great Word Smith? Oh, I am shaking with fear," she said sarcastically. "I've been waiting for this moment! I'll show him no mercy, though it'll be like taking candy from a baby."

So Eleanor Elizabeth had a sweet tooth for revenge! Well, I wasn't going to give up without a bite, I mean fight.

"The first event is **similes**, which are comparisons using *like* or *as*," explained Dr. Snooze. "The image is 'sunset.' e.e., you're up."

She clasped her hands in front of her chest and cleared her throat. "The sun burnished the Western sky like a bright orange comet."

The audience oohed, ahed, and applauded appreciatively at the word picture she drew. It was my turn. Sweat poured from my brow like a waterfall after a spring thaw. Gee, that wasn't a half-bad simile for someone so nervous.

"Five seconds, Smith," said Dr. Snooze.



"Uhm . . . the sunset glowed . . . no . . . blazed . . . no, glowed like a . . . yellow bug light on a hazy July night."

A few embarrassed giggles from the audience broke the uncomfortable silence. I definitely lost that round.

"The next event is hyperboles, which are extravagant exaggerations, not to be taken literally, and often ridiculous to make a point," said Dr. Snooze.

"I'm the best at hyperbole," said e.e. The audience cheered her playful use of a **superlative**.

"Really?" I said. "I could beat you with my tongue tied behind my back."

The audience jeered and the penalty whistle blew. "That was a mixed metaphor, Word," said Dr. Snooze. "If that happens again, you'll forfeit the round. Now, e. e., here is your phrase: 'My dog is so ugly . . .' Give us three hyperboles."



"My dog is so ugly . . . we had to pay people to pet him . . . the fleas moved out . . . he only has cat friends."

Bing-bing-bing! e.e. had scored a perfect ten. "Way to go!" hollered Ben. "Oops, sorry, Word, but she really is the best at hyperbole."

"Beat that, Word-boy," she said, "If you can."

Dr. Snooze cut in before I could come back with a wisecrack. "Your phrase, Smith is: 'It's so cold . . .'"

Cold, cold. My brain froze as if it had taken a headfirst dive into a giant Slurpee. Then some hyperboles came to me. "It's so cold the polar bears are wearing parkas." Yes! "It's so cold . . . the snow has turned blue." A bit esoteric, but in a poetry contest that could be to my advantage. I needed one more. "It's so cold, the ice cubes are . . . blue . . . and . . . wearing parkas." I knew that one stunk worse than dead fish, worse than old sneakers, worse than dead fish wearing old sneakers. The foul buzzer blared.

"Redundant phrasing, Word. No good," said Dr. Snooze.

"Allow me to complete your set," offered e.e., a bit too self-satisfied. "It is so cold that when I tried to take out the garbage, it refused."

The crowd roared with laughter. I was down two rounds and felt so low I had to part my toes to see where I was going.

"Our final event is the synonym speed round. Word, you're first. Your word is *happy*."

"You can do this, Word," said Ben.

I have to do this, I said to myself, for all that is good about language! "*Joyful, gleeful, ecstatic . . . and . . . and . . . filled with mirth.*" Alright! I had rattled off four synonyms in 10 seconds. Those crossword puzzles sure had improved my vocabulary. The crowd clapped politely.

"Your word, e.e., is *tasty*," said Dr. Snooze.

"A piece of cake," said e.e., winking to the crowd, who ate up her word play. She had purposely used an **idiom** which meant "easy," but also implied something tasty. "*Delicious, delectable . . . toothsome—*" she said.

"Two seconds left," said Dr. Snooze.

"And . . . *yummy*," called out Eleanor Elizabeth, smugly, but a bit shakily.

"Blat!" went the bell that signaled a foul.

"Sorry, e.e., but *yummy* is a slang word, and we can't accept slang here," explained Dr. Snooze.
"Word Smith wins that round."

The audience applauded louder now.

"Wait!" cried e.e. "I challenge."

Now the crowd really went wild. A challenge meant that I had to come up with yet another synonym for *tasty* and use it in a sentence. If I could do that, I'd get half her points. But if I failed, she'd win the round—and the contest.

Tasty. I thought of *appetizing*, but that wasn't strong enough and had as much to do with pleasing to the eye and sense of smell as with taste. *Unpalatable* . . . no, that was an **antonym**, which made me think of Antonio's spicy sausage pizza.



Yuck. Then I thought of Antonio's pizza the way I like it and out of my mouth came: *Savory*. The savory slice of pepperoni pizza made my mouth water."

The crowd leaped to its feet and gave me a standing ovation. Not only had I risen to e.e. cunning's challenge, I had created a sentence that used multiple alliteration. The fifty bonus points thrust me ahead of e.e. cunning.

"You won, Word!" said Ben Brannoor, clapping. "Well done."

"Or, as you British say, 'Good show.' Now let's get back those rhymes in time for Valentine's Day."

Eleanor Elizabeth sat on the floor of the stage, holding back tears. I took off the laurel crown that Dr. Snooze had placed on my head to symbolize my victory and brought it over to her.

"You did a fine job, e.e. And if you noticed, you didn't even need to use the stolen rhymes. I think you deserve this crown."

"But, you won it, Word."

"True. But it doesn't go with my film noir private detective look. You take it. Just give us back the rhymes."



e.e. looked at me, at Ben, and at the hopeful crowd. A single tear rolled down her cheek. "What I did was wrong. I see that now. I wanted to use the rhymes for my own selfish purposes. But there are millions of people out there who need rhymes for so many things: for songs and Valentine's Day cards, and Mother's Day cards, and to express the many wonderful moments that occur in our lives every day. I'll let myself heal and consider it a deal. "

"You're doing the right thing, e.e.," I said softly, handing her a handkerchief. "A good rhyme is a terrible thing to waste."

Glossary

alliteration (<i>n.</i>)	two or more words in a row that begin with the same letter (p. 5)
antonym (<i>n.</i>)	a word whose meaning is the opposite of another word (p. 21)
cadence (<i>n.</i>)	a rhythm or flow of sounds of words or the voice (p. 11)
embossed (<i>adj.</i>)	letters or words that are raised above the surface of the paper (p. 6)
haiku (<i>n.</i>)	a type of Japanese poetry (p. 14)
idiom (<i>n.</i>)	a word that has developed a meaning particular to its own region or to a group of people (p. 20)
linguistic (<i>adj.</i>)	relating to language and speech (p. 7)
palindrome (<i>n.</i>)	a word or sentence that reads the same both forward and backward (p. 10)
rhetorically (<i>adj.</i>)	asking a question only for effect and not seeking an answer (p. 9)
scansion (<i>n.</i>)	mapping the rhythm of stressed and unstressed syllables in poetry (p. 4)
similes (<i>n.</i>)	descriptive comparison of two unlike things as being similar, usually by using the word <i>like</i> or <i>as</i> (p. 16)
superlative (<i>n.</i>)	an extreme description (p. 18)
synonym (<i>n.</i>)	a word that has the same meaning as another word (p. 4)

Name _____

Instructions: Fill in the *Make* section with your prediction(s) about what will happen in *Word Smith, Private I: "Rhyme Crime"*. Fill in the *Revise* section to make changes to or add to your prediction. Write a check mark in the *Confirm* section if the prediction was correct, and write what actually happened in the *Actual* section.

Actual					
Confirm					
Revise					
Make					

Name _____

Instructions: Decide which events from the story are reality and which are fantasy. Write them under the correct heading.

Reality	Fantasy
1. _____ _____	1. _____ _____
2. _____ _____	2. _____ _____
3. _____ _____	3. _____ _____
4. _____ _____	4. _____ _____
5. _____ _____	5. _____ _____
6. _____ _____	6. _____ _____
7. _____ _____	7. _____ _____
8. _____ _____	8. _____ _____

Name _____

Instructions: Look at the sentences below. Insert the single quotation marks that are missing in each quote. The first one is done for you. Then, write your own sentences using single and double quotes correctly.

Example:

"Number four down. A seven-letter word meaning, 'the same.'"

1. "The image is sunset."
2. "If that happens again, you'll forfeit the round. Now, e.e., here is your phrase:
My dog is so ugly... Give us three hyperboles."
3. "Your phrase, Smith is: It's so cold..."
4. "Or, as you British say Good show. Now let's get back those rhymes in time
for Valentine's Day."

My Sentence is:



Name _____

Instructions: Decide which homophone fits correctly within each sentence. Write the answer in the space provided. The first one is done for you. Then write your own sentence using a homophone.

1. It is usually my number one _____ seller _____ (seller, cellar)
2. He had to take a _____ from the crossword puzzle. (break, brake)
3. The rain pounded on Word Smith's window _____. (pane, pain)
4. I opened the card and _____ the poem inside. (red, read)
5. All that were left were _____ sentences! (plain, plane)
6. I can see it from _____. (hear, here)
7. All the superstars of poetry would be _____. (there, their, they're)
8. But she got _____ famous _____ fast. (to, too, two)

Write your own sentences using homophones. Underline the homophone(s) in each sentence.



Microbes: Friend or Foe?

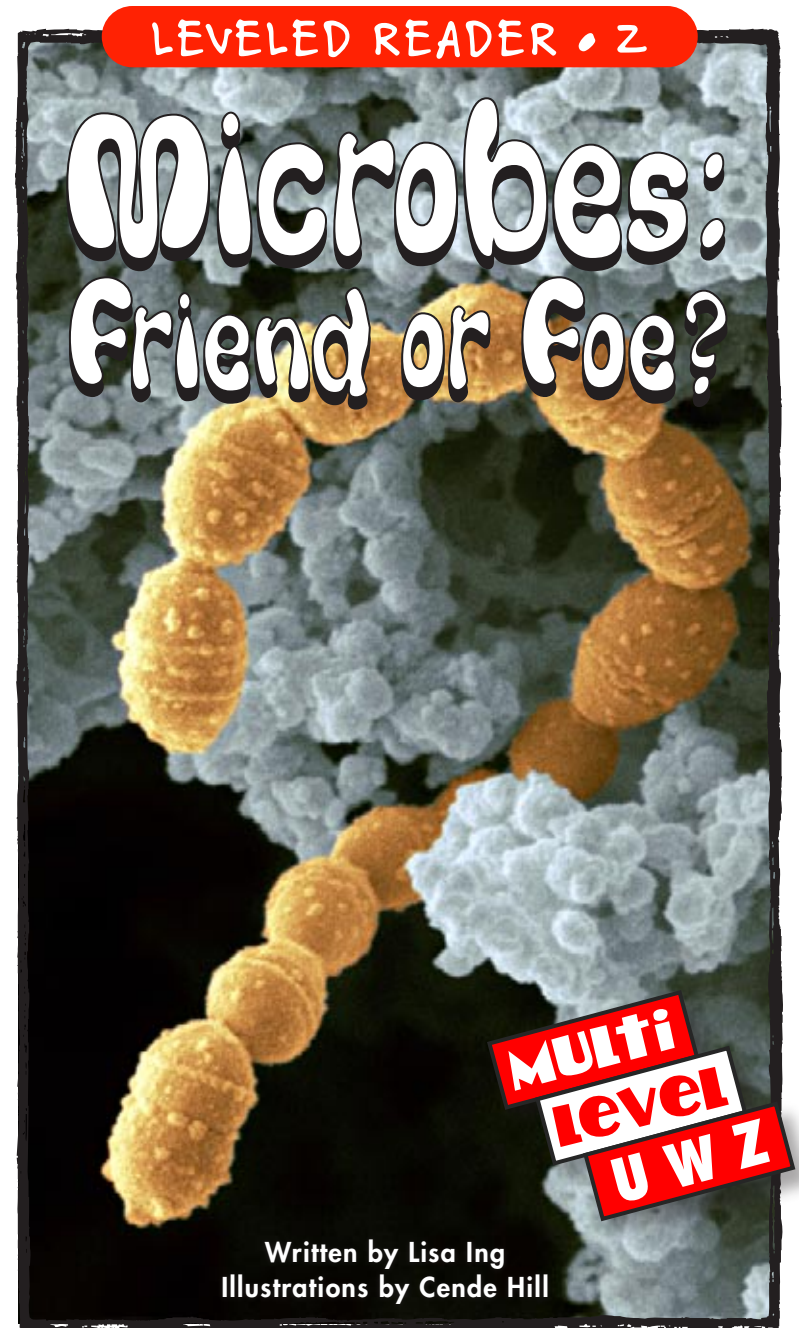
A Reading A-Z Level Z Leveled Reader

Word Count: 2,236



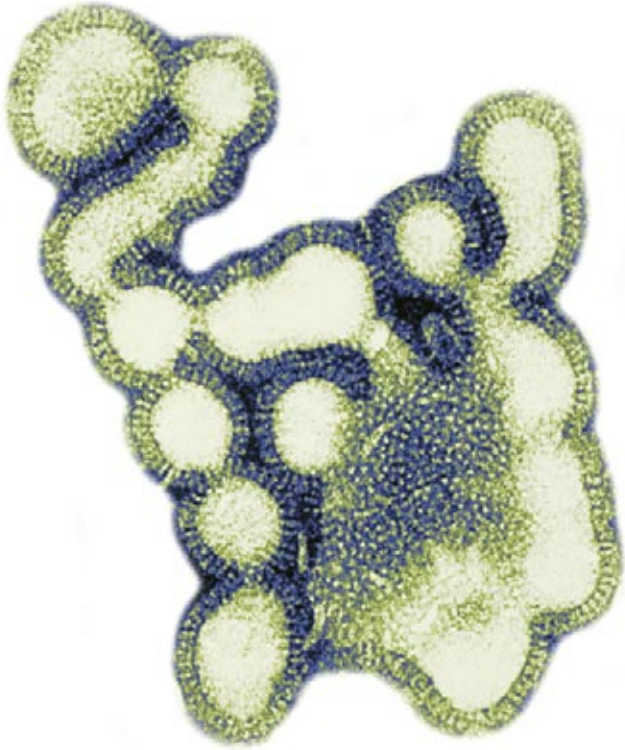

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Microbes: Friend or Foe?



Written by Lisa Ing
Illustrations by Cende Hill

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Correlation

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Reading Recovery	N/A
DRA	50



Table of Contents

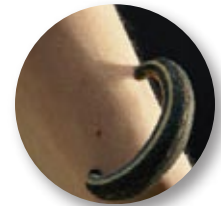
Introduction	4
What Are Microbes?	5
The Immune System	7
Four Groups of Microbes	9
<i>Bacteria</i>	9
<i>Viruses</i>	11
<i>Fungi</i>	13
<i>Protozoa</i>	13
How Do Microbes Spread Infection?	14
Outbreaks and Epidemics	15
Fighting Microbes with Vaccines	16
Antibiotics: The Magic Bullet	19
Conclusion	22
Glossary	23
Index	24

Introduction

Achoo! A sudden sneeze is often the first sign, or symptom, that you're getting sick. But it isn't just the sneezing. You're also coughing, you're tired, and your throat is sore. Whatever your **symptoms** are, they have probably been caused by an **infection** from a type of tiny **microbe**—a germ. But how did you “catch this bug,” or become infected—and what's a microbe, anyway?

Long ago, every sickness was a mystery. Doctors and medical schools didn't exist, and people often died from a simple illness, a minor injury, or a mild infection. Before scientists began to study disease and health, many superstitious people imagined they were being cursed by a witch or punished for something. Because no one knew about, or understood, what really caused any illness or how it was spread, no one knew how to prevent, or treat, a **disease**.

After years of scientific research and discovery, we now know that a variety of microbes can make us sick. But what are these microbes? Where are they found? Are all microbes bad? Can learning about them help us to stay healthy and prevent diseases?



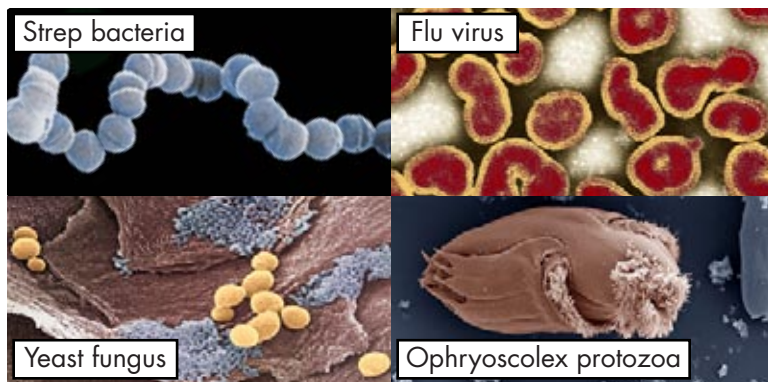
Doctors often used leeches to treat illnesses.

What Are Microbes?

Microbes are tiny, almost invisible, living **organisms**. They are so small that they can only be seen with a powerful **microscope**. These tiny organisms exist all around us. They are riding on the air we breathe, clinging to every surface we touch, sitting on our skin and on our shoes, and hiding inside of our bodies. They are everywhere!

Microbes multiply quickly inside our bodies, in our **cells**. Cells are small units of living matter that help us to stay healthy and grow. Our cells join together, almost like pieces of a puzzle. We have blood cells and bone cells, stomach cells, skin cells, and muscle cells. There are trillions of cells inside of us, and they all have important, health-protecting jobs to do. An unwelcome invasion of microbes can interfere with our cells' functions—and some can cause disease.

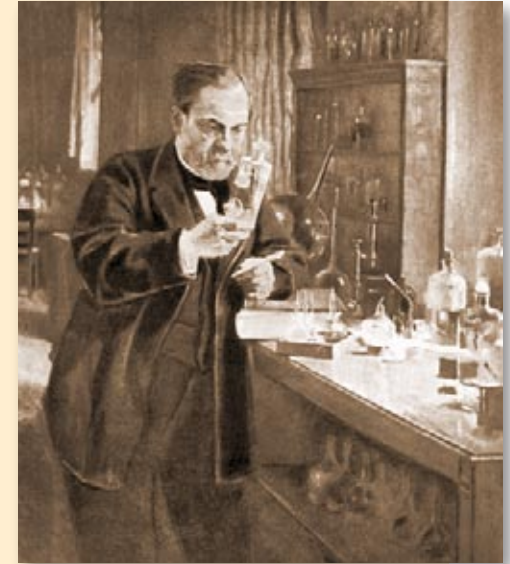
Different kinds of microbes



Louis Pasteur

Modern medicine owes a lot to Louis Pasteur (PASS-toor). He proved the Germ Theory of Disease, which states that contact with harmful microbes is the cause of disease.

Pasteur's most important discovery was that heating a sealed canister filled with food to a specific temperature for a certain length of time would kill many organisms inside. This heating process is called pasteurization. Today it is used on fresh milk and canned food.



Math Minute

To pasteurize milk, the milk is heated to 145 degrees Fahrenheit (62.8°C) for 30 minutes, or to 163 degrees Fahrenheit (72.8°C) for 15 seconds. How much quicker in seconds is it to pasteurize milk at the higher temperature?

$$1 = 3 + 5 + 2 = 10 - 4 + 10 \div 2 = 14 \times 2 - 3 = 25 - 5 - 5 \\ 2 = 17 + 3 \times 2 - 20 \div 2 - 5 \\ 3 = 3 + 5 + 2 = 10 - 4 + 10 \div 2 = 14 \times 2 - 3 = 25 - 5 - 5$$

The Immune System

Our body's **immune system** is designed to protect us from harmful microbes. It's made up of individually important parts that work together as a unified defense. It's a cooperative collection of all the different types of cells, glands, and tissues that form the structure of our bodies.

Math Minute

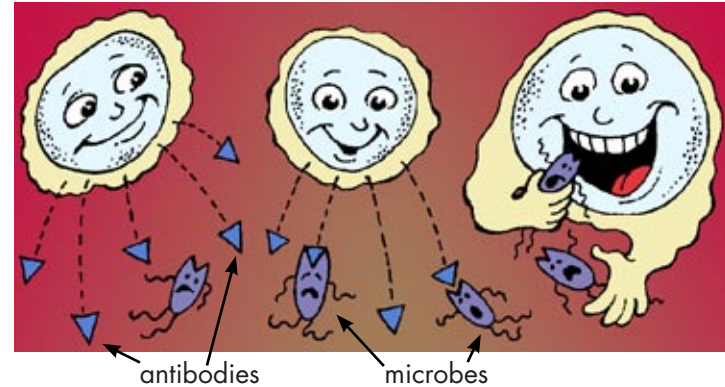
Some microbes can double their population every 20 minutes. If you start out with 1 microbe, how many microbes will you have after 4 hours?

Hint: Start with 1 microbe at 0 minutes.

Its ability to “remember” microbes is our immune system's best weapon against them. The immune system knows which microbes it's looking for. It recognizes the ones that cause problems. It remembers what defenses worked against them the last time they attacked—and fights them off. If you had the mumps or the measles when you were younger, your immune system has remembered those microbes. It's unlikely that you will get sick from mumps or measles a second time.

Do You Know?

One drop of blood contains between 7,000 and 25,000 white blood cells. These cells attack invading microbes in different ways. Some white blood cells produce antibodies that cancel out the microbe's chemicals, while others surround the microbe and destroy it.



So, how do our immune systems manage to keep out the troublemaking microbes? Outside, our skin forms a protective shield that covers us completely. It's important to clean, disinfect, and bandage cuts or scrapes to our skin so microbes can't enter the cut and cause an infection. Underneath our skin, there are microbe-hunting white blood cells that travel through our blood vessels. They find and destroy millions of harmful, **invading** microbes every day. White blood cells are the natural enemy of disease-causing microbes.

Four Groups of Microbes

Bacteria

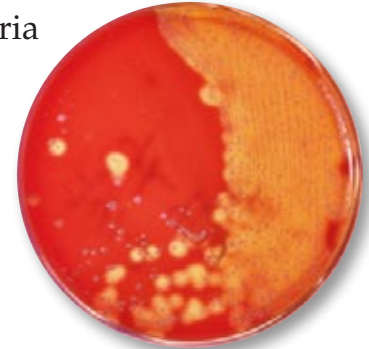
Bacteria (back-TEER-ee-uh) are everywhere and on everything—and they're tough. Some can thrive in barren ice, others in extreme heat. As with other microbes, some bacteria are good for us, and some aren't. There are more types of bacteria than there are types of any other organisms on Earth. By sheer population count, bacteria rule!



Fun Food Fact

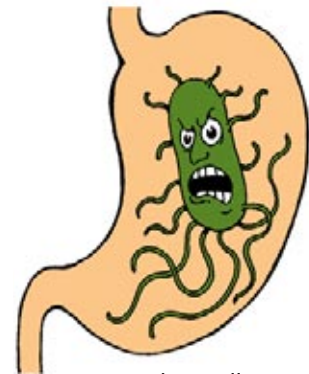
Several types of bacteria help change milk into yogurt and sour cream. These bacteria eat lactose, or milk sugars, and release lactic acid, which curdles the milk and makes it more solid. The lactic acid gives yogurt and sour cream a tangy, sour flavor.

One type of good bacteria lives in our intestines. It helps to break down and digest the food we eat, and we couldn't live without it. Nasty strep throat bacteria can cause a painful sore throat, a fever, a headache, an upset stomach, and tender, swollen glands in the neck. White spots of pus appear on the back of the throat.



Scientists sometimes grow bacteria on purpose so that they can study them. Here, strep throat bacteria grow in a dish filled with a liquid that provides food and a safe environment.

Food poisoning can make us very sick, as well. It's usually caused by harmful bacteria that live on, or in, many uncooked foods. Cooking food to the right temperature kills those bacteria. But there are other bacteria that live on the surfaces where we prepare food every day, and on our hands. Food poisoning often causes an upset stomach, vomiting, and diarrhea.

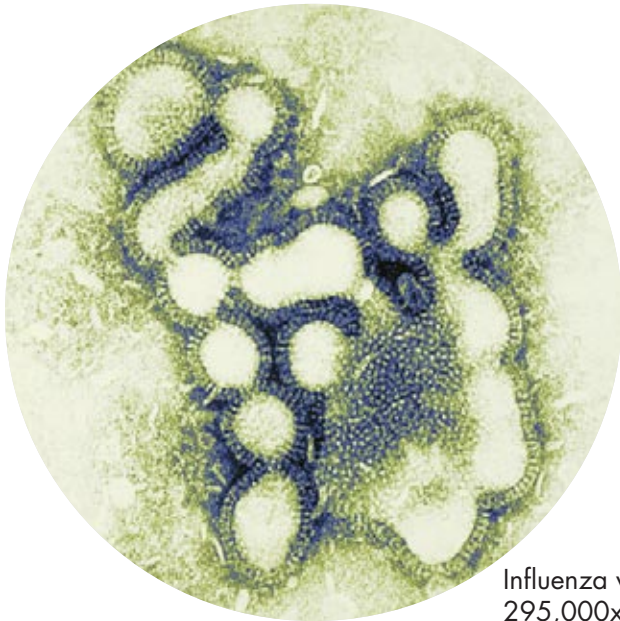


Salmonella is the bacteria responsible for many cases of food poisoning.

Viruses

Viruses (VY-russ-es) can be difficult to get rid of. A virus will invade the cells of people or other animals and spread quickly from cell to cell, causing an infection. Viruses not only make people sick, some viruses can cause death. And sometimes a virus can avoid detection by our watchful immune system.

A virus has the ability to **mutate**, or change its identity, to avoid being noticed. This ability to change makes it more difficult to find the virus and stop it. The flu, chicken pox, HIV, and the common cold are each caused by a virus.



Influenza virus at
295,000x magnification

Scientists are looking at ways to use viruses to help people get healthy, too. Viruses take control of the cells they invade and tell them what to do. If a cell started multiplying out of control, a scientist might be able to use a virus to tell the cell to slow down its growth. This treatment is being studied as a way to fight cancer, a disease in which cells grow out of control.

Do You Have a Common Cold or the Flu?

Symptoms	Common Cold	Flu
Headaches	No	Yes
Fever	None or Mild	High Fever, 102–104°F for days
Muscle Aches & Tiredness	Sometimes	Yes
Sore Throat	Yes	Sometimes
Runny Nose	Yes	Sometimes
Sneezing	Yes	Sometimes
Coughing	Yes	Yes
Chills	No	Yes

Fungi

There are many different types of fungi (FUN-guy). Some, like mushrooms, look like plants. But the microscopic type of harmful fungi that invade our body cause irritating, common infections like ringworm and athlete's foot. Ringworm causes a wormlike, itchy, red ring to appear on the skin. Athlete's foot fungi attack the bottoms of feet and area between the toes, causing the irritated skin to itch, crack, and peel.

Protozoa

Protozoa (pro-toe-ZOE-uh) are simple, single-celled organisms that often live in streams, ponds, and dirty water. We need to be careful about the water we drink. If protozoa get into your body, they can cause nausea, vomiting, and mouth infections.

One serious protozoa infection is spread by saliva from the bite of an infected mosquito. This protozoa microbe enters the person's blood, through the bite, and causes a disease called malaria. Malaria occurs most often in areas that have hot, tropical climates. This infection causes a high fever, weakness, and delirium, and it kills a million people every year.



Mosquitoes can transfer diseases like malaria and West Nile virus from person to person.

How Do Microbes Spread Infection?

Think about the times when you have been in a crowded place, near someone who is sneezing or coughing. You know they are spreading germs, and you wish they'd stayed at home. Most diseases are spread by our contact with an infected, or sick, person. Many infection-causing microbes live in bodily fluids such as saliva, blood, and nasal mucus. These fluids make it easy for microbes to transfer an infection from one person to another. Besides the germs that are coughed into the air, you can pick up germs if you handle something that has been touched and **contaminated** by someone who is sick.



Tissues help keep germs from spreading.

There are also several harmful microbes that can infect an insect or other animal first; then that infection can be passed to a human. We can get rabies from infected mammals such as dogs, raccoons, and skunks; and salmonella may be on chickens, birds, fish, and reptiles. Besides malaria, infected mosquitoes can also give us West Nile virus. Sick birds can transfer a serious avian flu, and Lyme disease comes from the bite of an infected tick.



Outbreaks and Epidemics

Diseases can be spread quickly. One sick person can infect dozens—and dozens of sick people can then infect hundreds more. It's even possible for people to infect others long before they know that they themselves are sick. A person who shows no signs of a disease, but who still infects others, is sometimes referred to as a “healthy carrier” and can be hard to find, isolate, and treat.

When a small group of people in the same place all get the same disease, it's called an **outbreak**. When an outbreak of disease rapidly spreads to a large number of people, it's called an **epidemic**. When an epidemic quickly spreads to infect larger groups of people around the world, it's called a **pandemic**.

A local outbreak of a disease is no longer expected to stay in one place. Disease-carrying microbes are hitchhikers, and they go wherever people go. Modern transportation—such as buses, trains, and airplanes, carry both people and their germs quickly. Sick travelers can infect any person they encounter during their trip. Then the people they just infected can start a separate outbreak in another place.

Fighting Microbes with Vaccines

No one likes to get shots—vaccinations—but they're important. A **vaccine** treatment is a way to plan ahead to prevent a disease. The job of a vaccine is to help build up our immune system's ability to recognize and fight off a disease-causing microbe. Many of these powerful vaccines are made from weakened, tiny bits of the harmful virus or bacteria itself.

Do You Know?

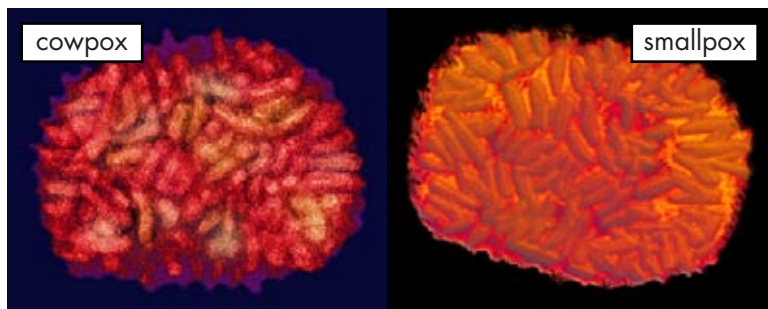
When Europeans and Africans carried *smallpox* microbes to the Americas, none of the Native Americans had ever been exposed to the disease. They had no immunity to it. As a result, smallpox killed millions. In South and Central America, nine out of ten people in the largest native cities died from smallpox.

The idea of using a virus to prevent a disease, or to use a mild disease to prevent a worse disease, was first thought of about two hundred years ago, in England. Dr. Edward Jenner treated many farm workers who caught a mild pox disease called cowpox. He also treated severe cases of deadly smallpox. Over time, Dr. Jenner noticed that people who had once been sick with cowpox never got the other pox disease, smallpox. But why? Smallpox is one of the deadliest diseases in the world, and it is highly infectious. Epidemics of smallpox killed many thousands of people.



Dr. Jenner realized that cowpox and smallpox must be related diseases, like being cousins from the same family. He became certain that having a case of cowpox must somehow provide some kind of natural immunity against getting smallpox. He thought that if he purposely gave the weaker disease to people before they were exposed to smallpox, it might reduce the number of people who were dying from it.

To test his idea, he would have to ask healthy people to volunteer to become sick with cowpox—and then wait to see what happened. Amazingly, people volunteered to help him. The people he gave cowpox to were mildly sick for a while, but they recovered quickly. While they were sick, their immune systems were learning about the pox microbe and developing a way to fight it.



Vaccines can be given as shots or taken by mouth.

Jenner's idea about the relationship of the two diseases was correct. The people in his test who were given the cowpox virus as a preventative treatment did not get the deadly smallpox virus later. His use of a weak version of a disease to stop a stronger version of a similar disease saved thousands of lives. Dr. Jenner is credited with stopping smallpox around the world.

About seventy-five years after Dr. Jenner's remarkable test, Louis Pasteur discovered how to weaken microbes and introduce them into the immune system. Then, as happened with the cowpox test, the immune system had the chance to learn about that microbe. It had its defense ready if the real disease attacked. Pasteur's experiments using weakened microbes led to the creation of several preventive vaccines—such as the flu shot—that could be given to large populations of people.

Antibiotics: The Magic Bullet

Scientists discovered that some microbes naturally fight, and kill, other types of microbes. They can do this without harming either healthy cells or other, helpful microbes. These special killer microbes naturally produce strong medicines called **antibiotics**. The antibiotics directly attack only the targeted infection.

Antibiotics are strong. But scientists were concerned to discover that the very strongest microbes sometimes survived an antibiotic treatment. Their research revealed several reasons why an antibiotic can fail. Sometimes the tough microbes change their identity just enough to hide from the antibiotic. In other cases, some antibiotics have become so overused, or misused, that microbes have developed a **resistance** to them. The microbe has learned to fight back. Scientists continue to research microbes and antibiotics. They try to produce new, different,

Do You Know?

In 1928, Dr. Alexander Fleming discovered that a common bread mold would kill bacteria. This discovery led to the world's first antibiotic, penicillin, which is still the world's most widely used antibiotic.

and more effective antibiotics to fight stronger, deadlier microbes.

Don't Spread Disease

Microbes like to travel. Microbes like crowds of people. Remember that when you're sick, it's important to stay home. Stay away from other people and rest. Doing both of these things helps your body fight harmful microbes. At the same time, it also keeps you from infecting other people.

Remember to cover it—and toss it! When you have a cold, always cover your mouth and nose with a tissue if you sneeze or cough. Then throw away the tissue in a trash can. If you don't have a tissue, cough into the side of your arm or cover your nose and mouth with your cupped hands; then wash your hands as soon as you can. If you are sick, avoid sharing food, cups, or plates with other people.



Germs, or harmful microbes, spread easily in crowded places.

Staying Healthy

Keep your immune system healthy

- In order to stay healthy, you must keep your immune system strong. Eat a balanced diet of nutritious foods, including fruits and vegetables, and drink lots of water. Get fresh air, exercise, and enough sleep each night.

Preparing food

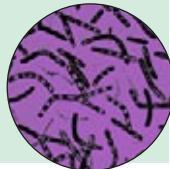
- Wash knives and cutting boards with water and soap after cutting raw meat, and never let raw meat touch cooked foods.
- Do not eat food from dented or swollen cans.
- Do not eat food that has fallen onto the floor.

Keeping clean

- The most important microbe-fighting action is staying clean with soap and water. Eighty percent of diseases are transmitted through touch because many people do not wash their hands. If everyone washed his or her hands, we could cut down the spread of disease.
- Wash your hands after you go to the bathroom, after touching animals, and before and after you make and eat food. Wash with soap for at least fifteen seconds, or as long as it takes to hum the song “Happy Birthday” twice. Rub soap lather all over your hands, even under your fingernails. Then rinse your hands and dry them on a clean towel.

Take care of your teeth

- Brush and floss your teeth to remove bits of food. Mouth bacteria cause cavities and feed on rotting food. Infections can easily get into your bloodstream through your mouth.



See a doctor regularly

- A healthy person should see a doctor once a year. Getting a regular checkup can prevent problems before they begin. Make sure you get all of your shots.

Outdoor safety

- When you go outside, do not touch wild animals. They may bite or scratch, or they may have disease-carrying bugs on them. Wear insect repellent to keep mosquitoes and ticks away when camping or hiking.
- Don't drink water that has not been purified and chlorinated.

Conclusion

Microbes live in, on, and around almost everything. Most microbes are harmless, but some of them can cause disease—and a disease can spread quickly. Some methods for preventing disease, such as the use of vaccines and antibiotics, are the result of over two hundred years of scientific discovery, medical research, and modern medical practices.

Many countries, organizations, and individual doctors are coordinating their efforts to control and even **eradicate** many diseases. Even with all of this effort, we will never be able to wipe out all of the world's harmful microbes. But we can learn how they cause infection and can help to control them. We can learn how to be healthier.

Glossary

antibiotics (<i>n.</i>)	medicines made from microbes to fight infections from other microbes (p. 19)
cells (<i>n.</i>)	the smallest independently functioning units in organisms (p. 5)
contaminated (<i>adj.</i>)	covered with harmful microbes (p. 14)
disease (<i>n.</i>)	a condition that changes the way the body normally functions (p. 4)
epidemic (<i>n.</i>)	the rapid spread of a disease within a community (p. 15)
eradicate (<i>v.</i>)	completely destroy (p. 22)
immune system (<i>n.</i>)	system that moves antibodies through your body to fight infection (p. 7)
infection (<i>n.</i>)	illness caused by microbes (p. 4)
invade (<i>v.</i>)	to enter aggressively to conquer, weaken, or injure (p. 8)
microbe (<i>n.</i>)	a microscopic organism, especially one that transmits disease (p. 4)
microscope (<i>n.</i>)	a device used to view tiny objects (p. 5)
mutate (<i>v.</i>)	to permanently change (p. 11)
organisms (<i>n.</i>)	living things, including people, other animals, plants, and microbes (p. 5)
outbreak (<i>n.</i>)	the quick spread of a disease (p. 15)

pandemic (<i>n.</i>)	the rapid, worldwide spread of a disease (p. 15)
resistance (<i>n.</i>)	the ability to fight against something (p. 19)
symptoms (<i>n.</i>)	telltale signs of an illness (p. 4)
vaccines (<i>n.</i>)	preparations containing a weak disease that teach the body to fight stronger forms of the same disease (p. 16)
viruses (<i>n.</i>)	microscopic organisms that infect the body; diseases caused by a virus (p. 11)



Index

antibiotic(-s), 19	malaria, 13
bacteria, 5, 9, 10, 14, 16, 19, 21	microbe(-s), 4–9, 13, 14, 16, 18, 19, 22
chicken pox, 11	Pasteur, Louis, 6, 18
cowpox, 16–18	pasteurization, 6
epidemic(-s), 15, 16	penicillin, 19
Fleming, Alexander, 19	protozoa(-n), 5, 13
fungi, 13	smallpox, 16–18
germ theory of disease, 6	strep throat, 10
immune system, 7, 8, 16, 18	vaccine(-s), 16, 18
infection(-s), 8, 11–15, 18–20	virus(-es), 5, 11–14, 16–18
Jenner, Edward, 17, 18	West Nile virus, 13, 14

Reading a-z

MICROBES: FRIEND OR FOE? • LEVEL 2 • 11

Synonym	Word Box	Antonym
Definition		
Sentence		

SKILL: CONTENT VOCABULARY

Name _____

INSTRUCTIONS: Identify and list the important information from the chapter in the *Important Information* boxes. Then use the information to create a summary in the *Summary* box.

Important Information	Important Information	Important Information	Important Information

MICROBES: FRIEND OR FOE? • LEVEL Z • 2

Summary

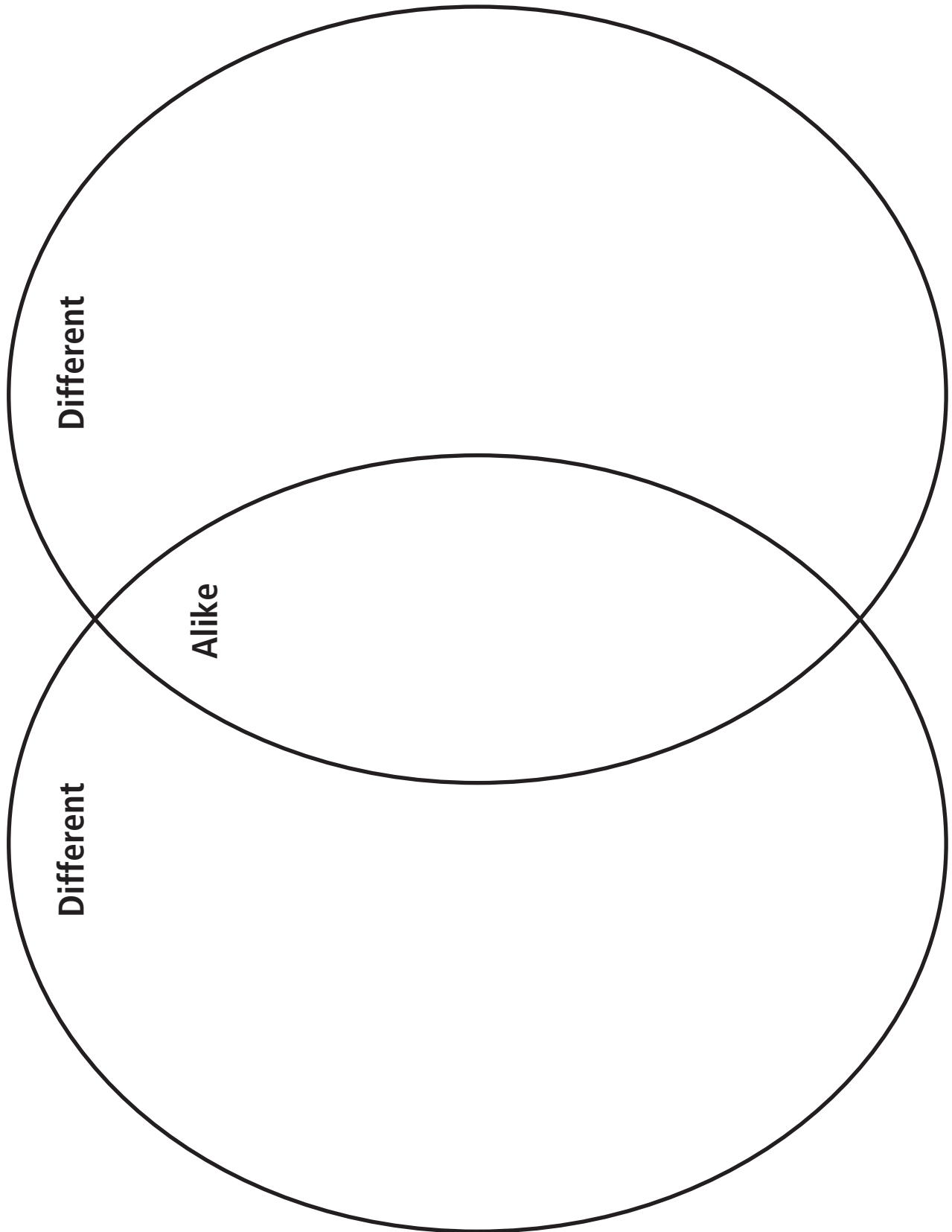
SKILL: SUMMARIZE

Name _____

INSTRUCTIONS: Use the information on pages 17 through 19 to compare and contrast vaccines and antibiotics. Write details that tells how vaccines and antibiotics are different in the outer circles. Write details that tells how they are alike where the circles overlap.

Topic: _____

Topic: _____



Name _____

INSTRUCTIONS: Read the sentences below. In each sentence, find the comparative or superlative adjective and circle it. On the line to the right, identify it by writing either *comparative* or *superlative*.

1. An antibiotic medicine kills most microbes,
but the strongest often survive. _____
2. Children's and senior citizens' immune systems
are weaker than those of healthy adults. _____
3. If a person stops taking antibiotics before finishing
the full dose, the toughest microbes will live. _____
4. Scientists keep trying to produce new antibiotics
to fight microbes that are stronger than others. _____
5. Smallpox was one of the deadliest diseases
in the world at the time. _____
6. Tiny protozoa are the simplest animals in the world. _____
7. Viruses are even smaller than bacteria. _____
8. Some organisms larger than protozoa
use the protozoa for food. _____
9. The microbes that survive will multiply
and become even stronger microbes. _____
10. When the microbes that survive multiply,
they will be deadlier than ever before. _____

MICROBES: FRIEND OR FOE? • LEVEL Z • 4

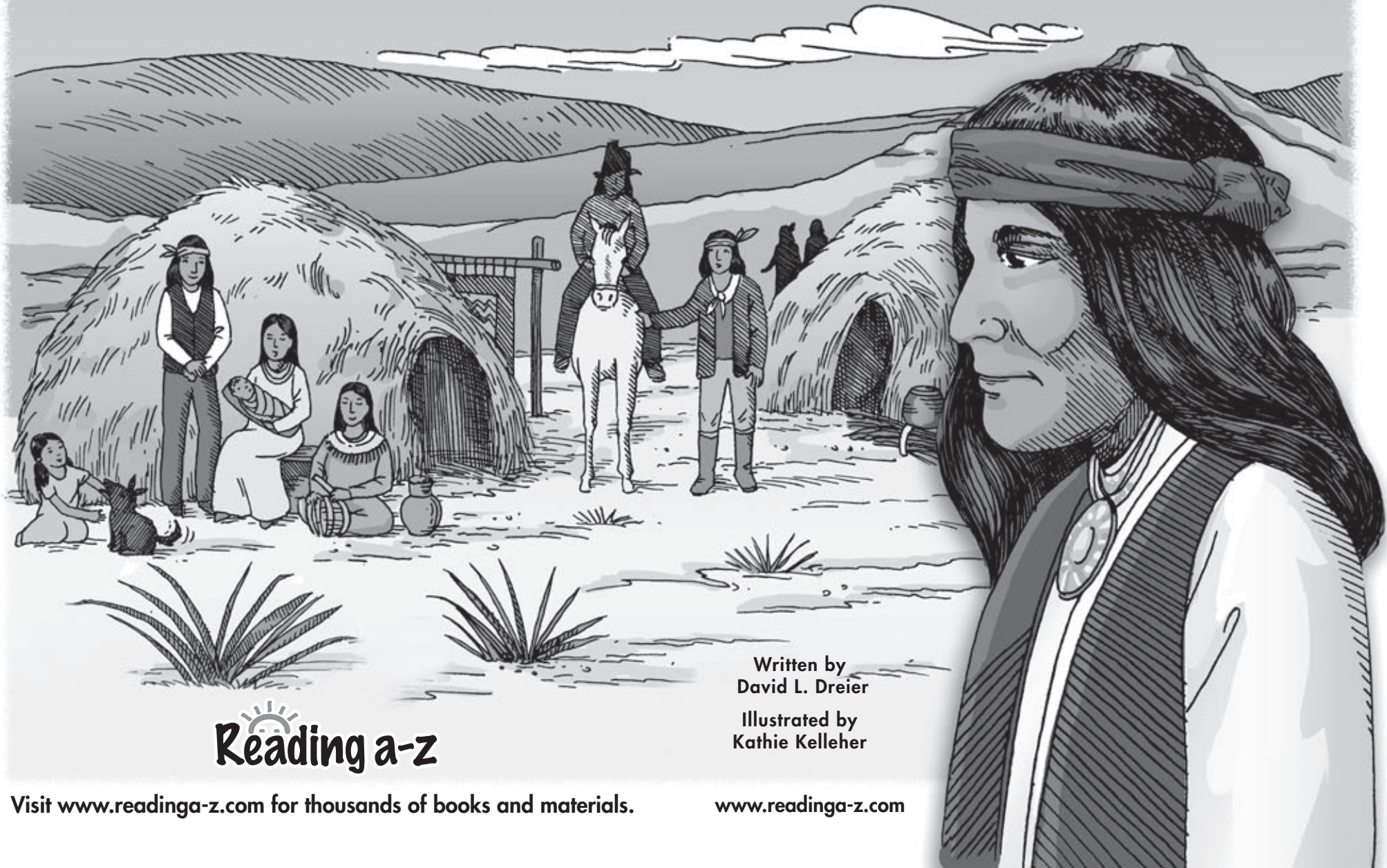
SKILL: COMPARATIVE AND SUPERLATIVE ADJECTIVES

The Apaches

A Reading A-Z Level Z Leveled Reader

Word Count: 2,717

THE APACHES



 **Reading a-z**

Written by
David L. Dreier

Illustrated by
Kathie Kelleher

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Editor's Note:

During the time this story is set, many people, including Native Americans, called Native Americans "Indians." Today, the terms Native Americans, American Indians, or First Nations refers more generally to the many different people indigenous to North America.

Title page:

Nearly 20 million people attended the 1904 World's Fair in St. Louis, Missouri, with about 100,000 visiting each day. This photograph shows the fair's midway, called The Pike.

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- The Cherokees, Level Z
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- The Haidas, Level Y

The Apaches
Level Z Leveled Reader
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DRA	50

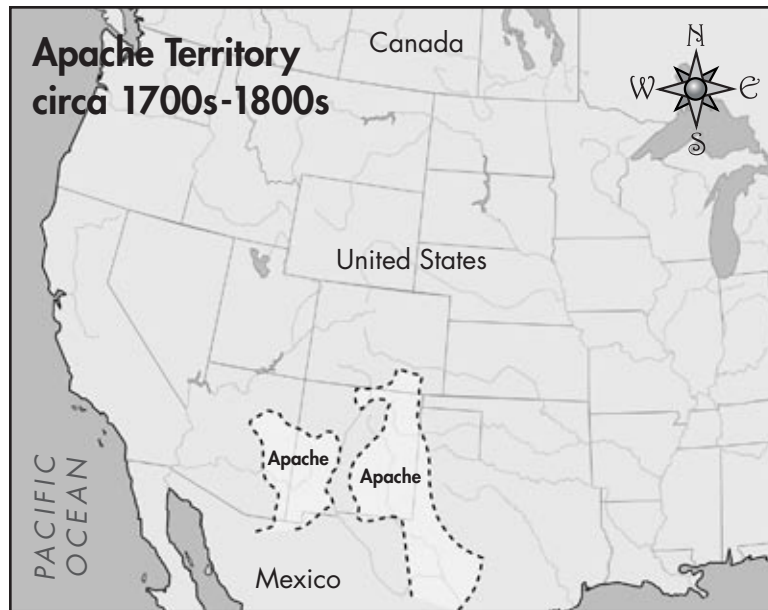
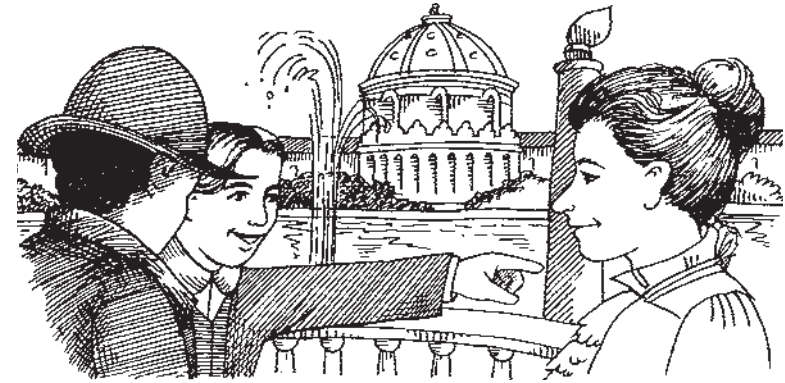


Table of Contents

The Apache Village	4
The Early Days of the Apaches	8
Goyathlay Becomes Geronimo.....	11
Cochise's War	14
Geronimo's Desperate Resistance	16
Prisoners of War.....	19
An Honorary Apache	20
Afterword	22
Glossary.....	24



The Apache Village

To a twelve-year-old boy from rural Missouri, the 1904 St. Louis World's Fair was a **spectacle** almost beyond belief. As he passed through the entryway with his parents, young Tom Richards gazed above him. "The Louisiana Purchase Exposition," he said, reading the official name of the fair. It had been 101 years since the United States had obtained the huge territory of Louisiana from France. The fair celebrated a century of progress since that time—a century in which the entire American continent had been settled.

It was a warm September evening. As the sky darkened, the fair glowed with electric light. On a huge lagoon at the center of the fairground, boats glided by, filled with laughing people. Tom felt as though he was in an earthly paradise. Never had he seen so many beckoning **attractions**.

"Well," said Mr. Richards, as they walked along a crowded **promenade**, "what should we see first? How about the Palace of Machinery?"

His wife consulted a map of the fair. "Well, we're closer to the Palace of Education." Mr. Richards shrugged. Mrs. Richards looked down at Tom. "What do you think, Tom?"

The boy wasn't particularly interested in either of those suggestions. He wanted to see something exciting. As he looked around, he spied an attraction that caused his eyes to widen.

"There, that's where I want to go!" he said, pointing to a colorful entrance on the Pike where cultures from around the world could be seen. "The Apache Village!"

A banner above the entrance promised, "WILD INDIANS! Have your picture taken with the **infamous** CHIEF GERONIMO—25 cents! Autographs just 10 cents!"

Tom's mother was not enthused. "I think we should see something more . . . educational," she said. Tom's face dropped with disappointment.

Tom's father stepped in to settle the disagreement. "Listen, your mother and I will visit the uplifting Palace of Education, and you

will go see the Apaches." Ignoring his wife's disapproving glare, he handed Tom some money. "We'll meet you back here in an hour—eight o'clock sharp." Tom nodded happily, and before there could be any further discussion on the matter, Tom was off to the Apache Village.

At the building's entrance, Tom bought a 25-cent ticket and passed through the admission gate. Inside, there was a re-creation of an Apache settlement. Apache men and women in full tribal dress went about village life. In front of dome-shaped dwellings called wickiups, the women sewed buckskins or tended to pots of food simmering over small fires. A few men sat on buffalo robes making arrows, while others groomed their horses.



Tom's attention was drawn to one of the wickiups on the far side of the village exhibit. There, several dozen people were lined up at a small table. At the table, an old Apache man sat writing with a pencil. Two armed guards stood nearby.

"Wow!" Tom exclaimed. "That must be Geronimo!"

"It is indeed," said a man's voice.

Tom looked around. A well-dressed gentleman about forty years old smiled down at the boy. On his lapel was a badge that said, "Official Guide." He extended his hand to Tom. "John Collins," he said.

Tom took the man's hand and shook it. "I'm Tom Richards."

"Glad to meet you, Tom. Welcome to the fair. How would you like to learn about Geronimo and the history of the Apaches?"

"Sure!" said Tom. "But I have to meet my parents in less than an hour."

"Well, then," said Mr. Collins, "I guess we'd better get started."

The Early Days of the Apaches

Tom couldn't take his eyes off Geronimo. "How come he has those guards standing near him?" he asked.

"Because he's a **prisoner of war**," said the guide. "Has been for close to twenty years now. But we'll get to his story in a minute. First, let's talk about his ancestors—the early Apaches." Mr. Collins led Tom to a wall of illustrations and photographs.

Mr. Collins stopped at a map of North America. "The Apache people originally lived up in Canada. Then, sometime after the year 1000, they started moving south along the east side of the Rocky Mountains." He ran his finger down the map. "By the 1400s, they were living in what is now Texas and eastern New Mexico. They numbered about 5,000.

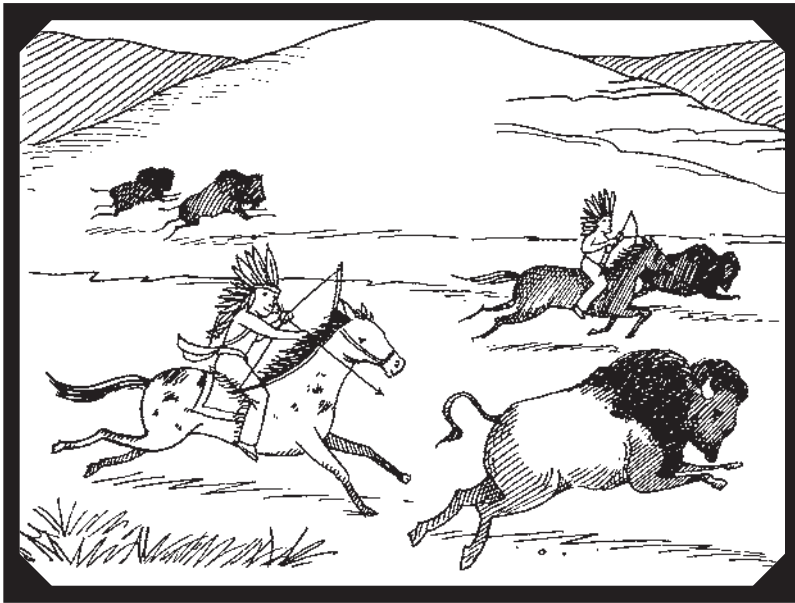
"The Apaches called themselves the Inday—the People. The name *Apache* comes from a Zuni Indian word, *apachu*, which meant *enemy*. Obviously, the Zunis didn't care much for them, eh?"

Mr. Collins took Tom to the next illustration. It was a painting of some men on horseback wearing strange-looking metal helmets and armor.

"These are Spanish soldiers," the guide said.

"Life started changing in a major way for the Apaches and other native peoples when the Spanish began settling in the Americas in the 1500s. The Spanish brought horses with them. Indians had never seen horses before. They were afraid of them at first, but they soon obtained horses from the Spaniards and became expert riders. The Apaches were among the first native people to use horses.

"The horse transformed the lives of Indians throughout central North America. It enabled them to become nomads. They began to move far and wide hunting buffaloes and other animals. Some Apaches did a bit of farming, but most of them were strictly hunters."



The next illustration showed a Spanish **mission**. "Life changed in other ways, too," Mr. Collins said. "Spanish settlers began moving into the Southwest in the 1600s and establishing towns and Catholic missions. The Apaches didn't want the Spanish taking their land, and they didn't want to become 'mission Indians.' This was the beginning of nearly 300 years of almost continual warfare between the Apaches and people they considered invaders. First it was the Spanish, then the Mexicans, and finally the Americans."

"Did they fight other Indians, too?" Tom asked.

"Oh, yes," the guide answered with a sad smile. "I don't think there was ever a tribe that didn't fight other tribes. One of the Apaches' main enemies was the Comanches. In the 1700s, the Comanches in Texas pushed many of the Apaches farther west. Those Apaches began settling in western New Mexico and in Arizona."

Goyathlay Becomes Geronimo

There was a bright flash of light from the opposite side of the room. Tom looked around, startled. He saw Geronimo standing next to a young man in front of a large camera on a tripod. A photographer was holding a smoking tray mounted on a handle.

"Flash powder," the guide said. "Lights everything up so you can take a picture inside."

"I want to have my picture taken with Geronimo," Tom said. "I have the money." He pulled a quarter from his pocket and held it up.

"Well, there's still a line. But while you're waiting, let's talk about Geronimo. We're coming to his part of the story now."

Mr. Collins led Tom to another picture. "This shows how Geronimo might have looked as a young man," he said. "He was called Goyathlay, which means 'He Who Yawns.' Funny name, huh? Not too scary. This shows him in 1858, when he was about twenty-nine."

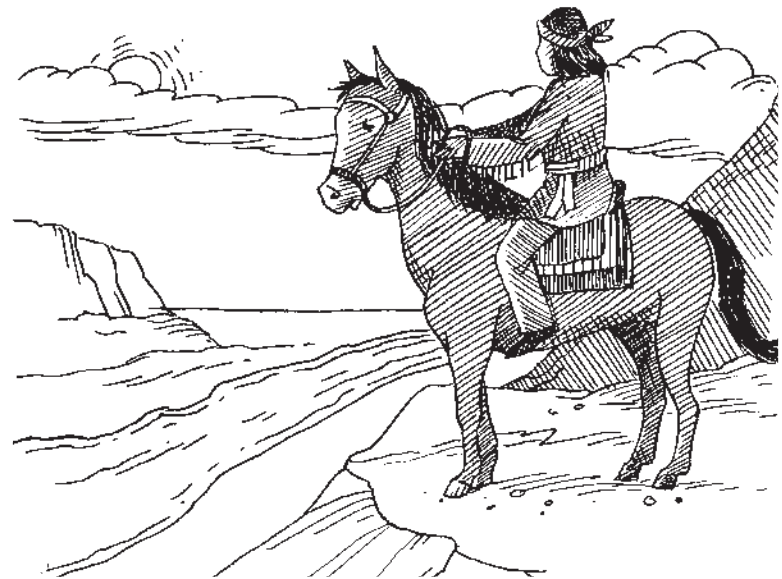
"By 1858, the Spanish were long gone," Mr. Collins said. "Mexico was an independent nation, and the Southwest was made up of states and territories of the United States. Goyathlay was a

member of the Chiricahuas (CHIR-ah-kow-ahz), a group of Apaches that lived mostly in the territory that would become Arizona.

"The Chiricahuas were pretty much at peace with everyone at that time. They sometimes made trips into Mexico to trade with the Mexicans. On one of those trips, Goyathlay came back to his camp and found that Mexican soldiers had murdered his mother, wife, and three children.

"From that moment on, Goyathlay had a vicious hatred of Mexicans. He wanted revenge. But he was a religious man, so he went up into the mountains to pray and meditate.

"As he stared up at the starry sky, Goyathlay



Apache Religion

The Apaches believed in a god of the universe, whom they called Usen—the One Who Knows. They also believed in spirits that dwelled in the mountains. They thought those spirits had taught their ancestors how to live. The Apaches believed in life after death, but Geronimo said he had no idea what the afterlife would be like.

heard a message: *No gun can ever kill you. I will take the bullets from the guns of the Mexicans . . .*

“That message from the Apache god, Usen, gave Goyathlay unlimited courage,” said Mr. Collins. “He led bands of Apaches in frequent raids across the Mexican border. He absolutely terrorized the Mexican soldiers . . .”

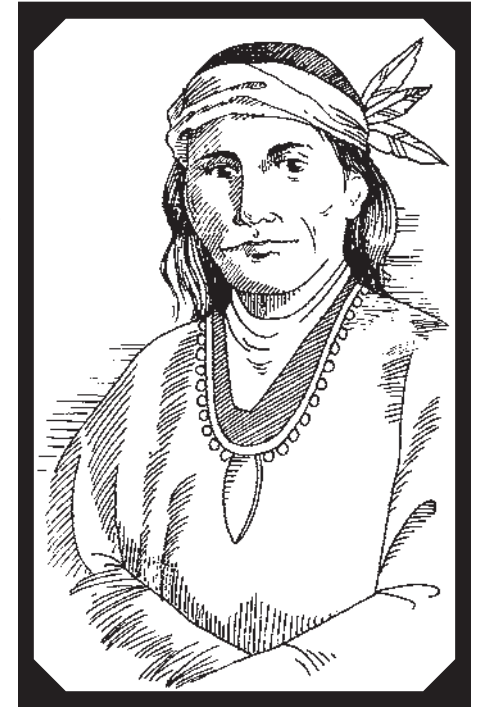
Tom pictured the scene in his mind:

*Seeing the **implacable** hatred in the eyes of the attacking Apaches, the Mexican troops dropped to their knees and wailed, “San Geronimo! San Geronimo!” But their cries did them no good. The Apaches killed them without mercy.*

“San Geronimo—that’s Spanish for Saint Jerome, their **patron saint**. Goyathlay took the name for himself. He became Geronimo.”

Cochise’s War

Mr. Collins showed Tom a picture of another Apache leader. “This is Cochise,” he said. “Although Geronimo was making a name for himself, it was Cochise who was the chief of the Chiracahuas. And he was keeping the peace with the Americans.

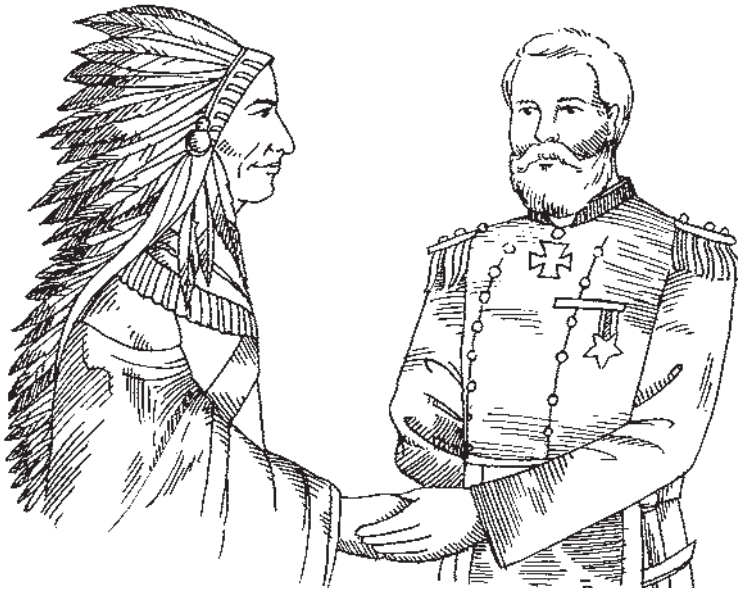


“Then in 1861, a young army lieutenant named George Bascom did a really stupid thing. He accused Cochise of a crime he didn’t commit and tried to arrest him. Cochise escaped but was wounded. Three of Cochise’s male relatives who were being held by the army as **hostages** were hanged.

Mr. Collins shook his head in dismay. “As a result of that tragic incident, Cochise went on the warpath against the Americans. For the next ten years, his Chiracahuas attacked settlers and wagon trains and fought battles with the United States’ army.”

"The army was determined to end the Apache uprising," the guide related. "In 1871, the army sent General George Crook to capture Cochise and his warriors. General Crook was an experienced Indian fighter, and he was determined to capture Cochise. But another army officer, General Oliver Otis Howard, beat him to it.

"In September 1871, Cochise met Howard in the mountains of Arizona. Cochise was now sixty years old, and he was tired of fighting. He said he would surrender if the Chiracahuas could have a reservation in their homeland in southeastern Arizona. General Howard consented to that request, and Cochise agreed to settle his people on the reservation. So that ended Cochise's war."



Geronimo's Desperate Resistance

"Well, back to Geronimo," said Mr. Collins. He took Tom to another picture, this one of Geronimo kneeling with his rifle. "This is the Geronimo who made Americans and Mexicans shake with fear. This photo was taken later in his life, after he had been captured for the last time. But he still looked **fierce**, didn't he?"

"He sure did," Tom agreed.

"When Cochise surrendered to Howard, all the Chiracahuas—including Geronimo—went to live on the Apache reservation. It had been established exactly where Cochise had requested. But that was valuable land, and lots of white people wanted it. So what do you suppose happened?"

Tom took a guess. "The Chiracahuas got moved someplace else."

"You are correct," said the guide. "Yes, after Cochise died in 1874, the government forced the Chiracahuas to move to the San Carlos Reservation. It was a terrible place out in the desert."



Mr. Collins took out a pocket watch. "When do you have to meet your parents?"

"At eight o'clock," Tom said.

"Good, you have another fifteen minutes to spend, so it's well we're nearing the end of the story." He put the watch back in his pocket.

"So—where were we? —San Carlos. Several tribes of Apaches had been sent to that god-forsaken reservation. Most of them no longer had any fight left in them. But the Chiracahuas still had plenty of fight. They decided they would rather die in battle than waste away on a dry, scorching reservation. So Geronimo and some other Chiracahua leaders escaped with their followers and returned to the mountains. That was the start of a new round of warfare and terror.

"The army pursued the Apaches relentlessly. Geronimo was taken back twice to the San Carlos Reservation, but each time he escaped."

"So how did it finally end?" Tom asked.

"Quietly," said Mr. Collins. Both the U.S. and Mexican armies were looking for Geronimo. In September 1886, an American general named Nelson A. Miles cornered Geronimo and his small band of Chiracahuas. They found them in a place called Skeleton Canyon in southern Arizona. Geronimo met with one of the general's junior officers, Lieutenant Charles Gatewood."

Tom again pictured the scene in his mind:

*Worn out from years of fighting, Geronimo laid down his rifle and shook Lieutenant Gatewood's hand. He asked the lieutenant about his fellow Chiracahuas in other **renegade** bands—how were they faring?*

"The ones who have surrendered have been sent to Florida," said Gatewood. "And that is where you will be sent as well. I'm sorry."

Geronimo nodded. He knew that this was the end.

"Geronimo and his people had fought desperately to preserve their way of life. But they had lost. It was his final surrender."

Prisoners of War

"Well," said Mr. Collins, "with Geronimo's surrender, the Indian Wars were finally over."

"What happened next to Geronimo and his people?" Tom asked.

"The Chiracahuas became prisoners of war. Geronimo and about 350 of his fellow Chiracahuas were sent by train to an army post in Florida." The guide pointed to a picture of Geronimo and other Chiracahuas sitting on the ground next to the prison train.

"Later, they were transferred to another post, in Alabama. The climate there was so bad that many of the Apaches died of tuberculosis and other diseases.

"Finally, in 1894, the remaining Chiracahuas were sent to Fort Sill in Oklahoma, and that's where they are today. And they're still prisoners of war. Geronimo can't go anywhere outside the reservation without being accompanied by armed guards."



An Honorary Apache

Tom looked over at Geronimo. The crowd of people was gone. And to Tom's dismay, the photographer was taking his camera down. "Oh, no!" he cried.

"You'd better run," Mr. Collins said.

Tom thanked the guide for his history lesson, and then he dashed across the room. "Hey, wait!" he said. "I want to have a picture taken!"

The photographer continued to **dismantle** his equipment. "Sorry, kid. Gotta go. Come back some other time."

Tom wouldn't budge. "No! I may not be able to come back! Come on!"

The photographer rolled his eyes. "All right, all right."

A minute later, Tom was standing with Geronimo in front of a dark curtain. There was a blinding flash of light as the photographer ignited a load of flash powder.

The photographer took Tom's quarter and wrote down his name and address. "I'll mail you a print," he said.



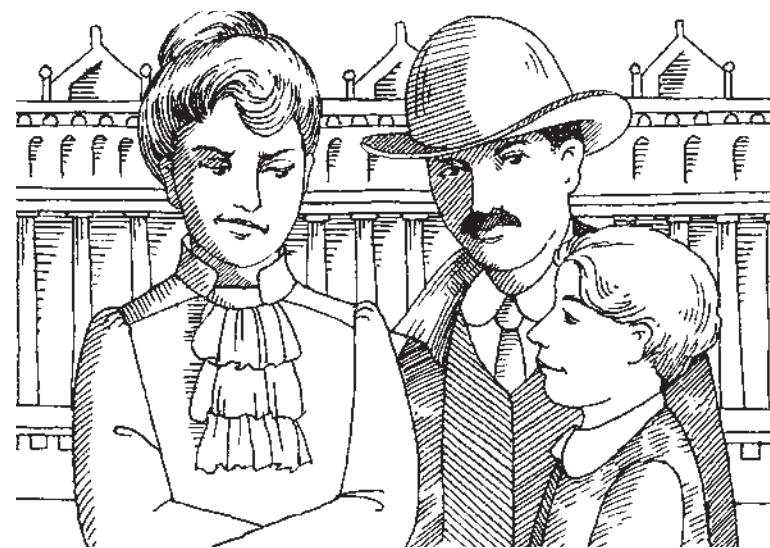
Geronimo patted Tom on the back. "You might have been a great warrior," he said with a smile. "I will make you an honorary Apache, huh? I will call you Stands His Ground."

Tom was wowed. "Thank you, Mister Geronimo!"

As Tom was leaving, he passed some posters with quotes from Geronimo. One, referring to the Apache people, read, *"I cannot think that we are useless, or God would not have created us. There is one God looking down on us all. We are all children of the one God."*

When Tom met his parents and told them about becoming an honorary Apache, Mrs. Richards rattled on about the Pike being nothing but sideshow spectacles. "I won't hear another word about it. We're only going to exhibits where you can really learn something."

Tom made no reply. He knew from Geronimo's story that there are times when standing your ground brings nothing but grief.

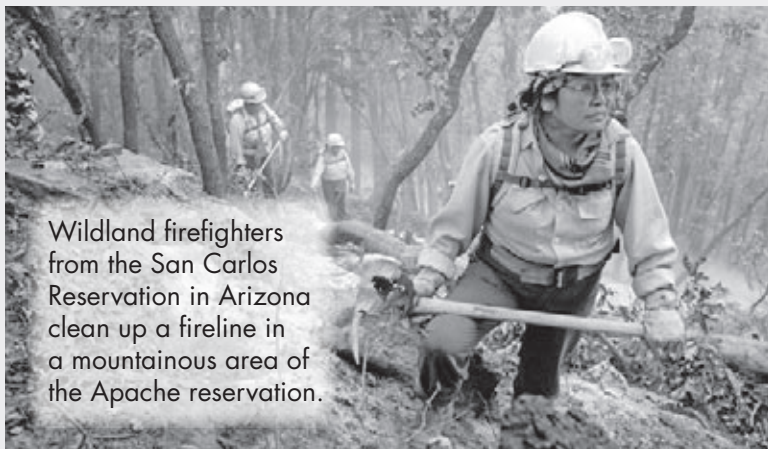


Afterword

Once a valiant war leader, Geronimo was in his old age a popular novelty. He appeared at a number of fairs and Wild West shows. In 1905, he rode in the **inaugural** parade of President Theodore Roosevelt. He died of pneumonia at Fort Sill, Oklahoma, in 1909 at the age of 79 or 80.

The Chiracahua Apaches remained prisoners of war at Fort Sill until 1913. They were then allowed to either move to a reservation in New Mexico or stay in Oklahoma. Those who remained in Oklahoma received small plots of land from the federal government.

Today, there are more than 50,000 Apaches in the United States, representing the Chiracahuas and several other groups. Nearly a third of them live on reservations in New Mexico and Arizona, where they have preserved a number of tribal traditions. Many Apaches work for lumber or cattle companies owned by the tribe.



Wildland firefighters from the San Carlos Reservation in Arizona clean up a fireline in a mountainous area of the Apache reservation.

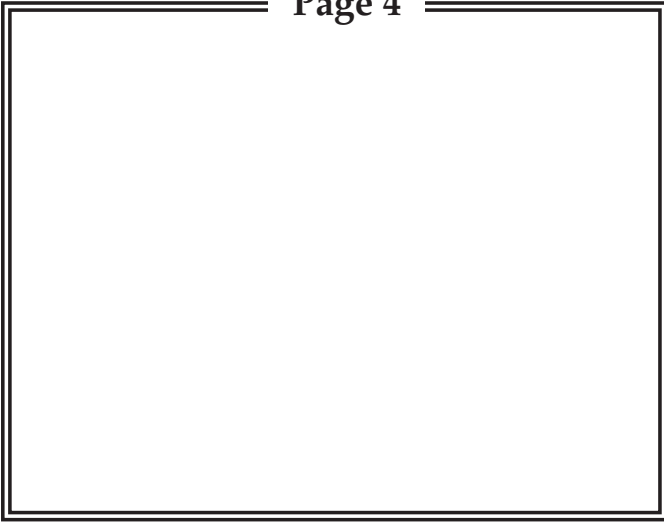
Glossary

attractions (<i>n.</i>)	people, things, or types of entertainment that people like (p. 4)
dismantle (<i>v.</i>)	to take apart piece by piece so that something stops working (p. 20)
hostages (<i>n.</i>)	people held prisoner until certain terms are met (p. 14)
implacable (<i>adj.</i>)	incapable of being soothed or softened (often refers to violent or angry feelings) (p. 13)
inaugural (<i>adj.</i>)	marking the beginning of something (in the United States, often refers to the start of a president's term) (p. 23)
infamous (<i>adj.</i>)	famous for being evil, bad, or dangerous (p. 5)
patron saint (<i>n.</i>)	a holy person recognized as the special protector of a person or group (p. 13)
prisoner of war (<i>n.</i>)	somebody taken and held by an enemy during a war (p. 8)
promenade (<i>n.</i>)	a public place for walking that is for pleasure or to be seen by others (p. 5)
renegade (<i>n.</i>)	a person who rejects the laws of a group (p. 18)
spectacle (<i>n.</i>)	an unusual or impressive object or event seen in public (p. 4)

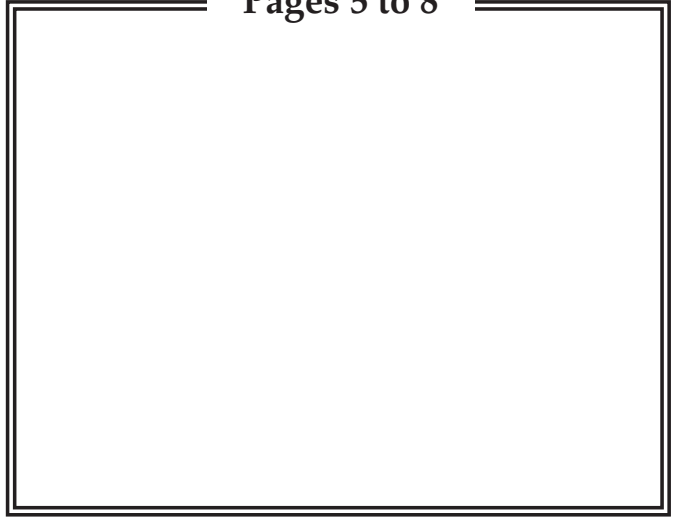
Name _____

Instructions: Have students draw what they visualized in their mind for the pages indicated above each box.

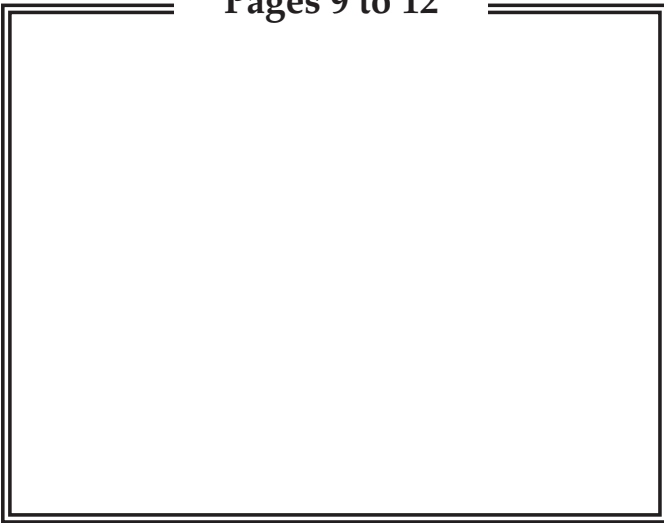
Page 4



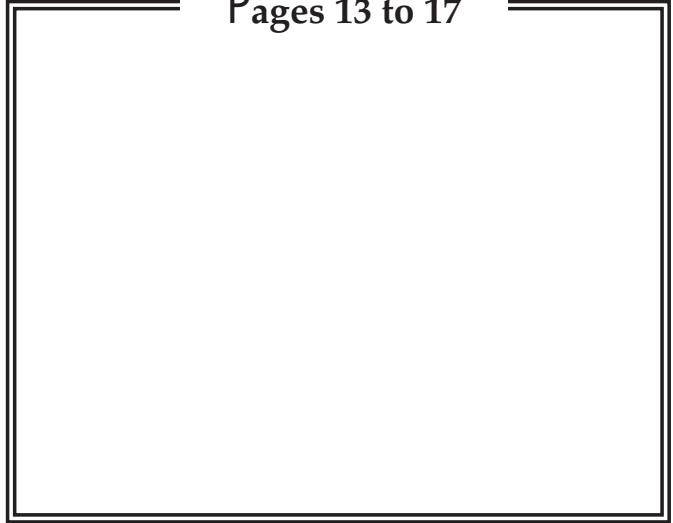
Pages 5 to 8



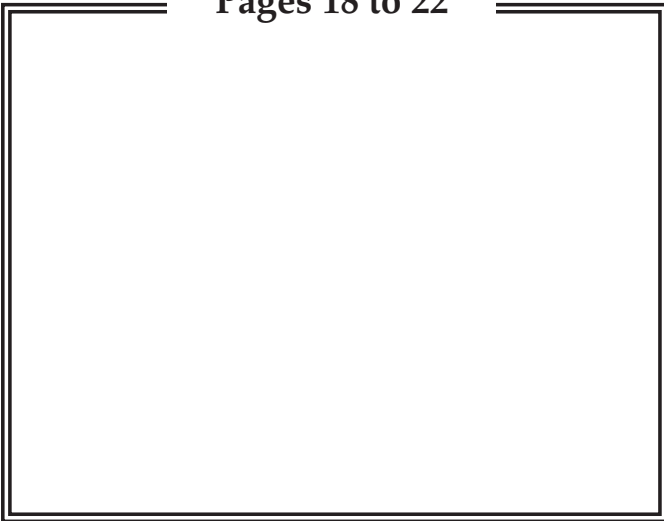
Pages 9 to 12



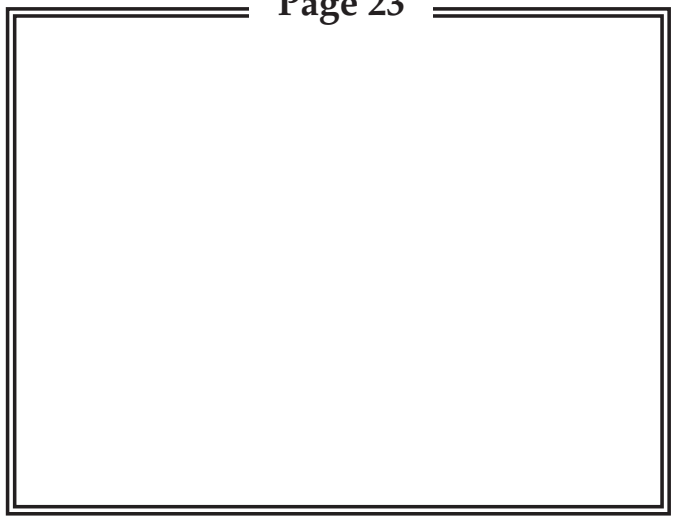
Pages 13 to 17



Pages 18 to 22



Page 23



Name _____



Instructions: As you read, fill in the timeline below with important dates and events.

[illegible]

THE APACHES • LEVEL Z • 2

SKILL: SEQUENCE EVENTS

Name _____

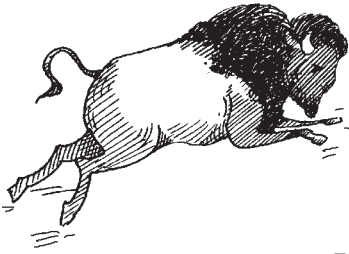
Instructions: Read the sentences below and decide whether they contain dashes or hyphens. Then write *dash* or *hyphen* on the line to the right of the sentence.

1. To a twelve-year-old boy from rural Missouri, the 1904 St. Louis World's Fair was a spectacle almost beyond belief. _____
2. The fair celebrated a century of progress since that time—a century in which the entire American continent had been settled. _____
3. "Have your picture taken with the infamous Chief Geronimo—\$2!" _____
4. "We'll meet you back here in an hour—eight o'clock sharp." _____
5. Tom bought a 25-cent ticket and passed through the admission gate. _____
6. In front of dome-shaped dwellings called wickiups, the women sewed buckskins. _____
7. A well-dressed gentleman about forty years old smiled down at the boy. _____
8. "First, let's talk about his ancestors—the early Apaches." _____
9. "The Apaches called themselves the Inday—the People." _____
10. It was a painting of some men on horseback wearing strange-looking metal helmets and armor. _____
11. He pulled two one-dollar bills from his pocket and held them up. _____
12. "San Geronimo—that's Spanish for Saint Jerome, their patron saint." _____
13. "When Cochise surrendered, all the Chiracahuas—including Geronimo—went to live on the Apache reservation." _____
14. "So, where were we?—San Carlos." _____
15. He asked the lieutenant about his fellow Chiracahuas in other renegade bands—how were they faring? _____



Name _____

Instructions: Write the words to show how you would read these abbreviations aloud.



Example:

Mr. _____ Mister _____

Sept. _____

Mrs. _____

St. _____

TX _____

NM _____

AZ _____

U.S. _____

Oct. _____



LEVELED READER • Z

The Cherokees

A Reading A-Z Level Z Leveled Reader

Word Count: 2,643

The Cherokees

Written by David L. Dreier
Illustrated by Stephen Marchesi



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The Cherokees



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The Cherokees
Level Z Leveled Reader
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Correlation

LEVEL Z	
Fountas & Pinnell	U-W
Reading Recovery	N/A
DRA	50



Table of Contents

A Link with the Past	4
Olden Times	7
Treaties and More Treaties	10
An Amazing Change	13
Final Defeat	15
A New Life in a New Land	20
Back to Present Day	22
Glossary	24



A Link With the Past

With lunch over, a bored Debbie wandered away from the campsite. "Don't go far," her mother called after her as she cleaned off the picnic table.

Debbie rolled her eyes. "Don't worry, Mom. I'm just gonna take a short walk."

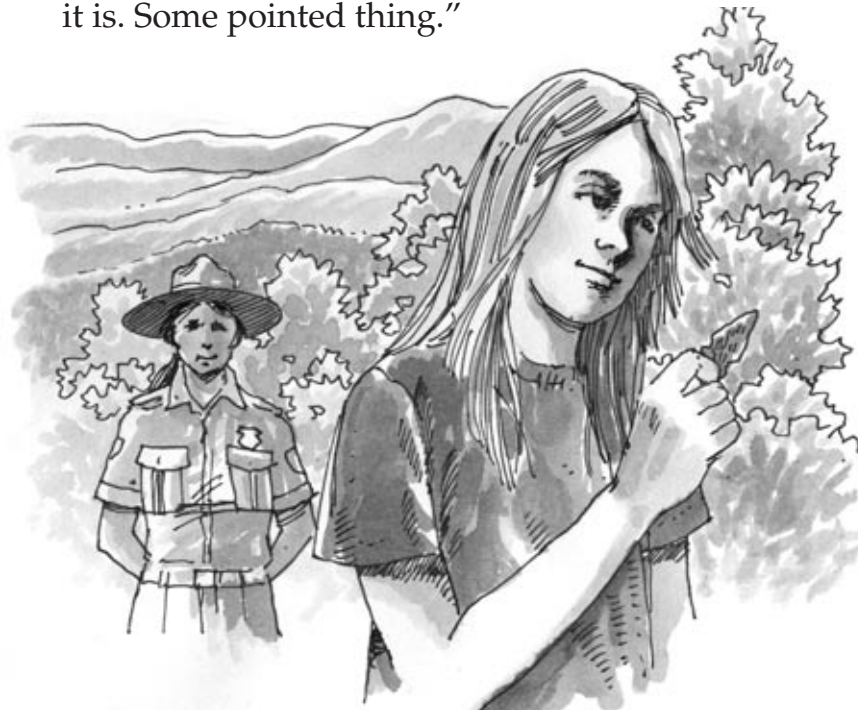
"Parents!" Debbie mumbled to herself. "Always worrying about every little thing." At the age of twelve, Debbie was quite able to look after herself, thank you very much.

The girl strolled through a grove of fragrant pine trees, going nowhere in particular. She came to an overlook along the path and gazed across Great Smoky Mountains National Park. She saw several distant mountain ranges, and a bluish mist blanketed the valleys between the low, forested mountains. "This must be the most beautiful place in the world," she sighed. "I wish we could live here."

Debbie walked to a grass-covered **embankment** and sat down at the base of a tree. She picked up a stick and poked lazily at some loose soil by her feet. Suddenly she noticed a small brown object in the turned-up dirt. She picked it up, rubbed it clean, and examined it. It was some sort of stone point.

"Well, what have you there?" said a friendly female voice. Startled, Debbie stood up. A young woman in a park ranger's uniform was smiling down at her. She had a tan complexion and dark hair tied in a long ponytail.

Debbie held up the object. "I don't know what it is. Some pointed thing."



The ranger reached forward and gently took the object from the girl's hand. She looked at it and smiled—a *bit sadly*, Debbie thought.

"It's a flint arrowhead," the ranger said. "Probably made hundreds of years ago by a Cherokee warrior."

"What's a Cherokee?" Debbie asked, taking the arrowhead back and rubbing it between her fingers.

"The Cherokees were Native American people who once lived in these mountains. They were my ancestors. I'm half Cherokee on my mother's side, and my name honors her family heritage—I'm Anna High Cloud. What's your name?"

"Debbie Smith. You have a really pretty name."

"Thank you. My people have many interesting names. And they have a very interesting—and often sad—history. Would you like to hear about it?"

Debbie nodded. "Sure."

"Well, then," said Anna, "make yourself comfortable, because there's quite a bit to tell."

Debbie leaned back against the tree. Anna adjusted her ranger hat, and then she began her story.



Olden Times

"Let's make this as visual as we can," Anna said. "I want you to actually see the things I'm telling you. Pretend you're wearing magic glasses that let you fly into hidden places and see into the past."

"Okay," said Debbie. "This is going to be fun." She adjusted her magic glasses with a smile.

Anna pointed to the mist-shrouded mountains. "Now, look out across those mountains and then fly back into the past and down into a valley. You're landing beside a beautiful rushing river—all clear and cold with a pebble bottom. Large fish are darting through the water."

"I can see it," Debbie exclaimed.

"Good. Now look around. There, near the bank of the river, is a large Cherokee village: about fifty houses made of tree branches and mud that look like big, round, upside-down baskets. In the center of the village is a large meeting house. You're looking at the way things were in the 1600s."

"More than a hundred people lived in this village," Anna continued. "It's one of about two hundred Cherokee villages in what became North Carolina—where we are now—and a few other southeastern states. There were more than twenty thousand Cherokee people, divided into seven large clans, or groups. The Cherokees had been living in this area for about six hundred years, since migrating from the north."



Debbie nodded, her eyes fixed on the past.

“These people didn’t call themselves Cherokees,” Anna said. “That name came from a word used by another Native American nation, the Creeks. The Creeks called my ancestors ‘the Chelokee,’ which means ‘People Who Speak Differently.’ The”—she wiggled two fingers of each hand in the air to make quote marks around the next word—“‘Cherokees’ called themselves the Principal People.”

Anna smiled. “Well, let’s see what’s going on in the village. Oh, look, some men are coming back from a hunt, carrying freshly killed deer on poles. The older children are out picking wild plants and berries. Many of the women are working in the village farm, tending crops of corn, beans, and squash.”

Debbie could see it all, as though she was watching a movie.

The ranger’s voice grew wistful. “The Cherokee people had a wonderful life in these mountains. They believed that the Creator—the Great Spirit, or God—would see to it that they never had to leave.”



Treaties and More Treaties

“Didn’t the Cherokees ever have wars?” Debbie asked.

“Yes, they did,” Anna replied. “I was just getting to that. War was always an important part of life. Nations fought with each other over land and to settle disputes. But they also fought one another just for the . . . the glory of it, I guess you’d say. Bravery in battle was how a young man made a name for himself. But the wars were usually limited. Nations didn’t try to **exterminate** one another.

“However, things began to change when Europeans started settling in America in large numbers. That was in the early 1700s. Settlers were hungry for land, and they wanted all native people—including the Cherokees—removed.”

Anna spoke more quickly now. “The Cherokees always tried to get along with the Europeans. They fought them only when they felt they had no choice. They signed one peace treaty after another, hoping each time that it would bring peace.

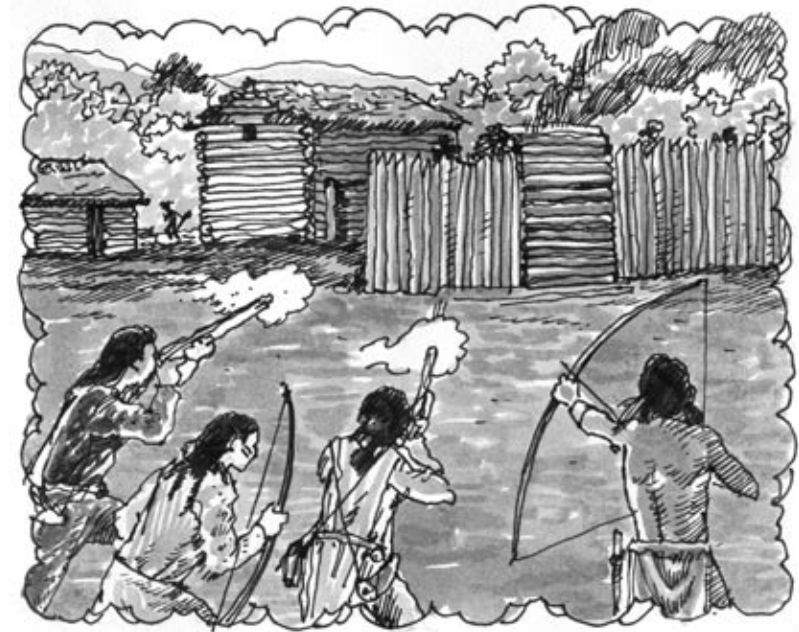
“They signed the first treaties with the British, when they ruled North America. Then, later, Cherokees signed treaties with the United States. Each treaty took more land away from the Cherokees. Every time, they were promised that they could have their remaining lands forever. But every time, the other side broke the treaty.”

“How come?” Debbie asked.

“Because there were too many people who wanted land—and because, at that time, many people didn’t think of Native Americans as people with rights. To them, the Cherokees and other Native Americans were just a dangerous **nuisance**.”

“So why did the Cherokees keep signing treaties?” Debbie asked.

“They had no choice. It was either sign a treaty or go to war. So they signed. But one group of Cherokees, the Chickamaugas, finally decided that they would not sign any more treaties and continue to give up more of their land. For about twenty years, they fought settlers and soldiers.



“Use your magic glasses and imagine hundreds of painted warriors shouting war cries as they attack a settlement with rifles, bows and arrows, and tomahawks.”

Debbie shivered.

“By the late 1790s, the Chickamaugas’ fight for land they believed was theirs was over. They gave up their land and moved west into Arkansas, which was ruled by Spain. The United States acquired the territory a few years later. The Chickamaugas then became part of the Western Cherokees who had already settled there. After that, warfare between the Cherokees and the Americans came to an end.”

An Amazing Change

"So what happened next?" Debbie asked.

"Well," Anna replied, "have you heard the **expression** 'If you can't beat 'em, join 'em'?"

Debbie shook her head back and forth.

"It means that if you can't defeat an opponent, you should change to become like your opponent, so the two of you can get along. The Cherokees still living in the East decided to change their way of life and become just like other Americans. They thought that if they did that, people would accept them and let them keep their remaining land."

"Did they change?" Debbie asked.

Anna nodded and smiled. "They sure did. Many Cherokees became successful plantation farmers and lived like the settlers. They also adopted the new American culture in other ways."



Debbie was fascinated. "What other ways?"

"The Cherokees built schools and established a system of courts. A Cherokee man named Sequoyah invented a type of alphabet for the Cherokee language, and most Cherokees learned to read. The Cherokees then published a newspaper and books in their own language. They even wrote a **constitution** for all their people, who called themselves the Cherokee Nation. When they had accomplished all this, they were very proud. They said to themselves, 'Surely, now, the people of the United States will let us live in peace.'"

Sequoyah's Accomplishment

Sequoyah (seh-KWOY-uh), who was half Cherokee, was born in about 1770. He single-handedly invented a new system of writing. He spent twelve years developing his writing system. The system is a syllabary (SIL-uh-bare-ee) that uses eighty-six symbols to represent all the syllables in the spoken Cherokee language.



Final Defeat

Anna gazed for a few moments at the misty mountains, the cherished homeland of her ancestors. "Well, now we're coming to the saddest part of the story," she said.

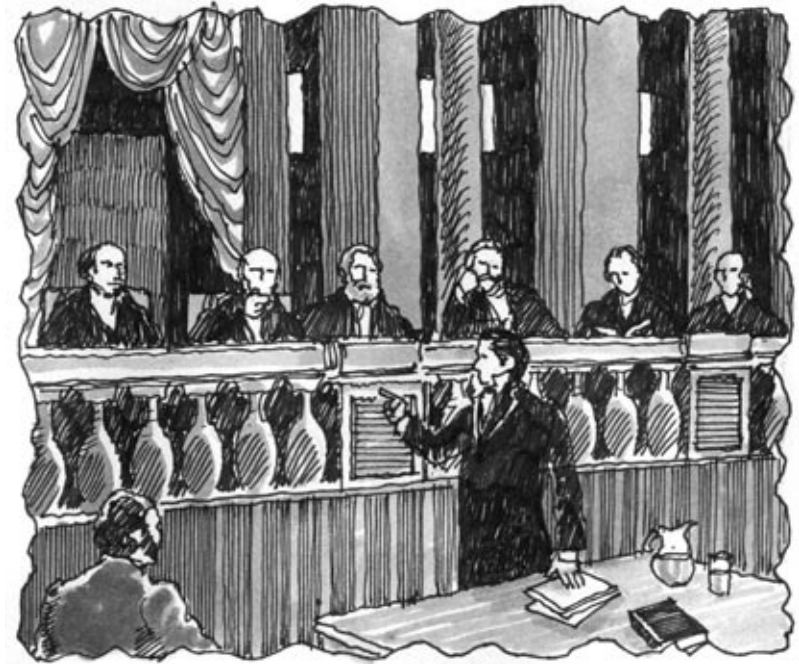
Debbie had suspected the tale might end badly and sat down with Anna next to the tree. "What happened?"

"Even though the Cherokees did everything they could to become like other Americans, it was useless. In 1830, Congress passed a law called the Indian Removal Act. The law required the Cherokees and four other tribes in the southeastern United States to move to a western area called the Indian Territory. They were given eight years to move themselves and all their possessions."

"That was so unfair!"

"Yes, it was. The Cherokees decided to fight—but this time with lawyers. They went to the U.S. Supreme Court seeking protection, and the Supreme Court sided with them."

"So they got to stay?"



"No. The president of the United States, Andrew Jackson, refused to enforce the Supreme Court decision. He was in favor of making the Cherokees and the other tribes leave the eastern United States. So the Cherokees decided to make one last try for justice."

"What did they do?"

"They made a direct appeal to President Jackson. In 1834, a man named John Ross went to see the president. Even though Ross was only one-eighth Cherokee, he was deeply committed to the Cherokees, and he was their most important chief.

"Andrew Jackson was a stern-looking man. He was more than six feet tall, with bushy gray hair swept back from his forehead. John Ross was a short fellow, only five-and-a-half feet tall. But he made up for his lack of height with an unshakable **conviction** that his cause was right. Picture them meeting in Jackson's office in the White House."

"Okay," said Debbie, with another adjustment of her invisible glasses.

"Jackson and Ross made polite conversation for a few minutes. Then they discussed the matter at hand. Ross insisted that the Indian Removal Act was wrong. He urged Jackson to let the Cherokees stay on their land and to protect them with U.S. troops. Jackson listened but said very little.



"Ross thought he might have persuaded the president to do as he asked, but then his hopes were shattered. Jackson said that the Cherokees must go to the Indian Territory, and he wouldn't budge from that position. The fate of the Cherokees was sealed.

"In 1838, the deadline for the Cherokees to depart **voluntarily** for the Indian Territory arrived. Most of the Cherokees had refused to leave, so U.S. troops pulled them out of their homes. Mobs burned their houses and stole their cattle and possessions."

"This is just awful," Debbie said.

"It gets worse," Anna replied. "The Cherokees were put in stockades—temporary prisons. Then they were shipped west on riverboats and in railroad boxcars. For the last eight hundred miles of the journey, they had to walk. All along the way, they were robbed and cheated by anyone who had a chance to do so.

"Food supplies from the government were sometimes stolen. Many people got sick from hunger and from **unsanitary** living conditions. Of the eighteen thousand Cherokees who started the long journey, more than four thousand died before reaching the Indian Territory. Many of the dead were simply left at the side of the road."

Debbie could see it all.

“This was such a terrible time for the Cherokees that it’s called the Trail of Tears,” Anna said.

Debbie had tears of her own trickling from the corners of her eyes.



A New Life in a New Land

“The Cherokees tried to make the best of their new situation,” Anna continued. “They decided to start a new **civilization** in the Indian Territory. First, they joined with the Western Cherokees—remember, the ones who lived in Arkansas?”

Debbie nodded.

“Those Cherokees had also been sent to the Indian Territory. So, the Western Cherokees became part of the Cherokee Nation. And the

Cherokee Nation became part of a group of southeastern tribes that were called the Five Civilized Tribes. The other four tribes, which included the Creeks, Choctaws, Chickasaws, and Seminoles, had also been resettled in the Indian Territory.

“The Cherokees and the other tribes did well in their new home. Each tribe had its own land and formed its own government. Some Cherokees became very **prosperous**, just as they had been back in the east. But most of them lived very simple lives.”



Indian Territory later became the state of Oklahoma

"So everything went pretty much okay after that?" Debbie asked.

"Well, not quite. When the American Civil War started in 1861, the Cherokee Nation sided with the South—the Confederate states. After the war ended, the United States was angry about what the Cherokees had done. So it started taking away their land for railroad construction and to build towns.

"Sometime after that, the government divided the remaining lands of the Cherokees and the other Five Civilized Tribes into small pieces. The Cherokees ended up with just a tiny part of the land they had originally been given.

"But it was all just part of the settlement of the country. People wanted to make that area into a state. In 1907, what had once been the Indian Territory became the state of Oklahoma."



Back to the Present Day

"Well, that's just about the end of the story," Anna said. "There are now about 300,000 Cherokees living in the United States, most of them in Oklahoma. But there are more than 13,000 living here in North Carolina."

Debbie was puzzled. "Oh, really! Did they move back here from Oklahoma?"

The ranger smiled. "No, they're the **descendants** of Cherokees who've been here all along. This is one happy little part of the story that I've saved for last. When the Cherokees were being rounded up back in 1838, about a thousand of them escaped and hid out in the mountains. The army finally gave up looking for them, and the government later gave them permission to stay. They became known as the Eastern Band of Cherokees."

"Wow, that's great."

"Yeah. And in 1889, the government set aside a large portion of the Great Smoky Mountains for a Cherokee reservation. It's just a short distance from here, and it's where I grew up."

Debbie eyes lit up. "Awesome!"

Just then Debbie saw her parents waving to her from the edge of the campground. "Oops, there's my mom and dad. I guess I'd better go."

"Thanks very much for telling me about your people," Debbie said, realizing she had rubbed the arrowhead in her hand to a shine.

"It was my pleasure," Anna said, as she watched Debbie gently replace the arrowhead where she had found it. Anna and Debbie got to their feet and shook hands. Then, with a quick "Bye," Debbie turned and walked back toward the campground.

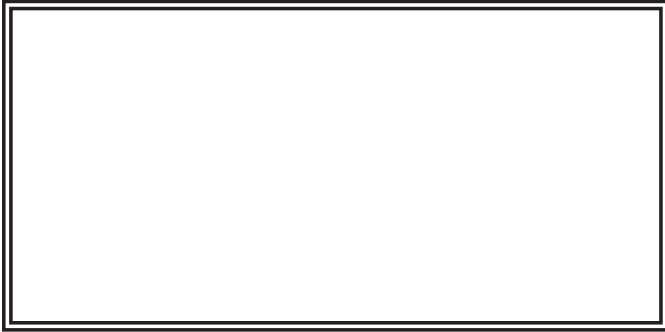


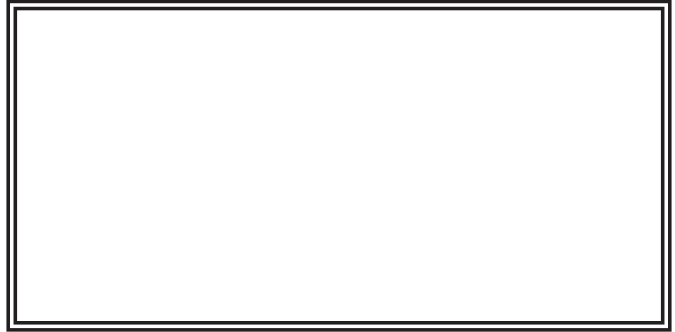
Glossary

civilization (<i>n.</i>)	an organized society with an advanced form of government, religion, science, language, art, and learning (p. 20)
constitution (<i>n.</i>)	basic laws of a state or nation that tell how the government is run (p. 14)
conviction (<i>n.</i>)	a firmly held opinion or belief (p. 17)
descendants (<i>n.</i>)	people, animals, or plants related to someone or something that lived in the past (p. 22)
embankment (<i>n.</i>)	a ridge or mound of dirt that holds back water or supports a railroad track (p. 5)
expression (<i>n.</i>)	a group of words used to communicate a thought, feeling, or idea (p. 13)
exterminate (<i>v.</i>)	to kill or destroy somebody or something (p. 10)
nuisance (<i>n.</i>)	an annoying person or thing (p. 11)
prosperous (<i>adj.</i>)	having success; well off (p. 20)
unsanitary (<i>adj.</i>)	not healthy; dirty (p. 18)
voluntarily (<i>adv.</i>)	done out of free will (p. 18)

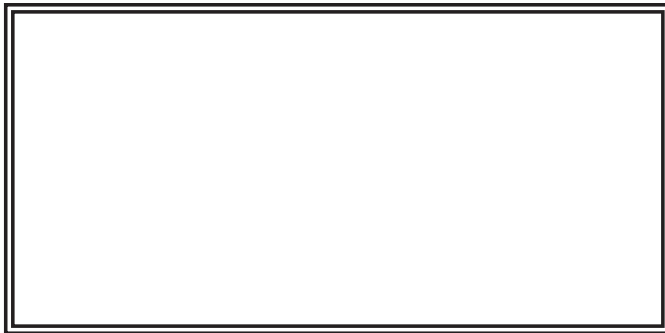
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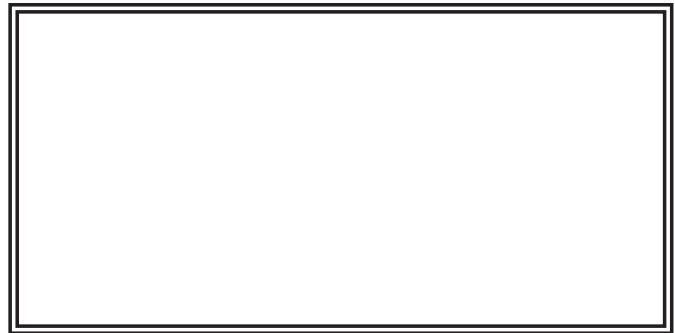
Instructions: Draw pictures to represent parts in the story where you stopped to visualize in order to understand what you'd just read. Write a description below each picture to explain your drawing.

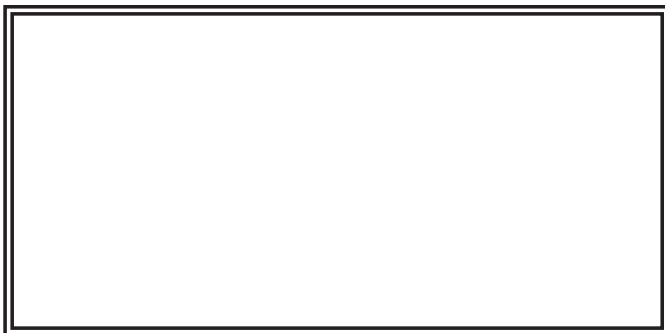


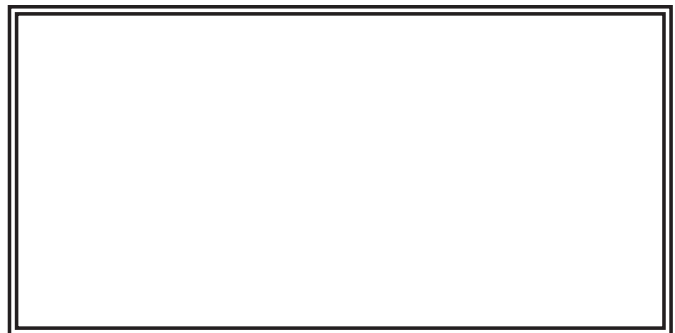


THE CHEROKEES • LEVEL Z • 1





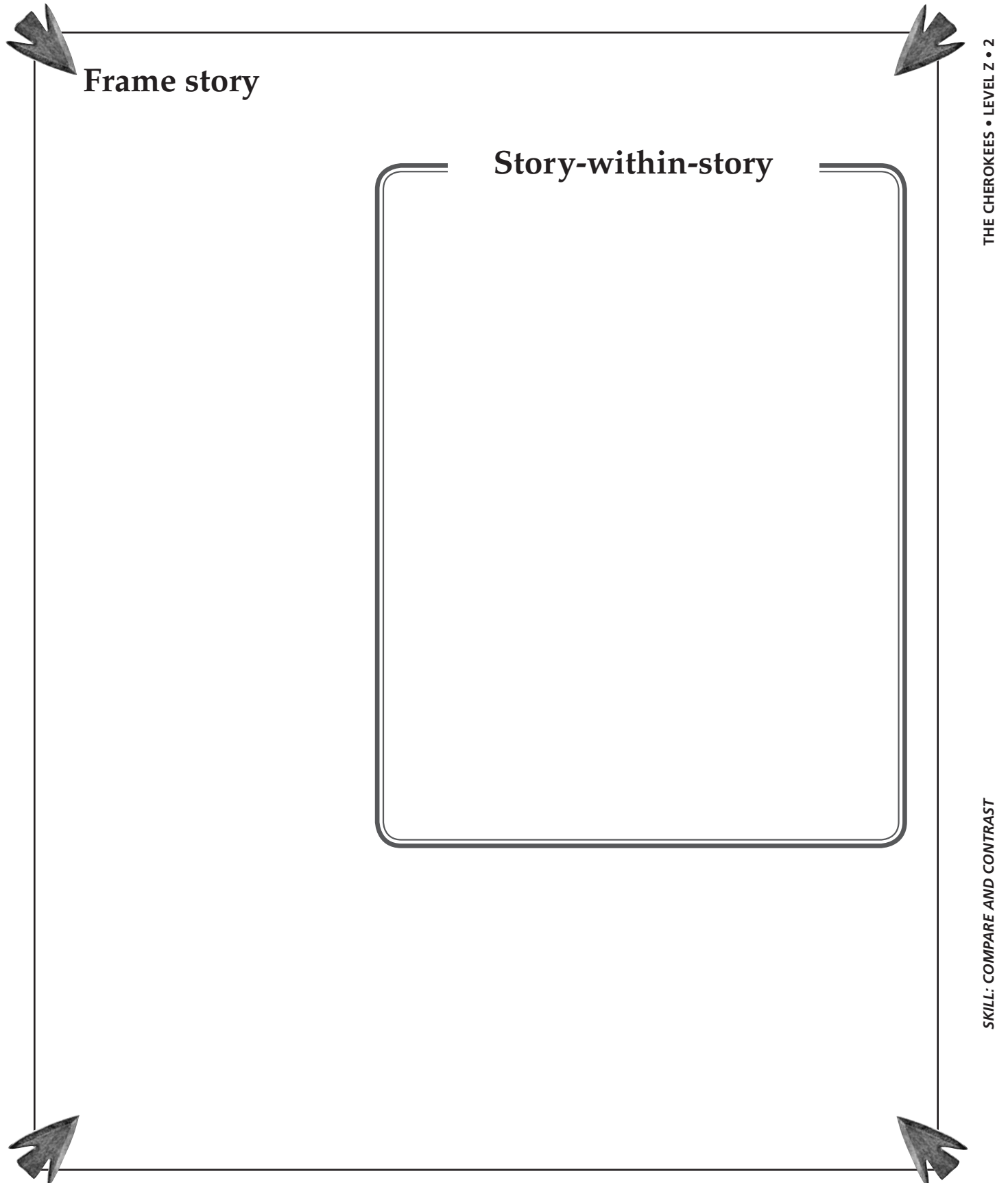




SKILL: VISUALIZE

Name _____

Instructions: Compare the *Frame story* to the *Story-within-story*. Write a summary of the Frame story in the outside area of the frame. Write a summary of the *Story-within-story* on the inside area for the frame.



Frame story

Story-within-story

THE CHEROKEES • LEVEL Z • 2

SKILL: COMPARE AND CONTRAST

Name _____

Instructions: Use your book to find all of the past-tense irregular verbs that the author used in sections 1 through 3: Olden Times, Treaties and More Treaties, and An Amazing Change. Write all of the past-tense irregular verbs in the left-hand box below, and then write all of their present-tense matches in the right-hand box.

Past-Tense Verbs	Present-Tense Verbs
Section 1:	
Section 2:	
Section 3:	

LEVELED READER • Z

The Cheyennes

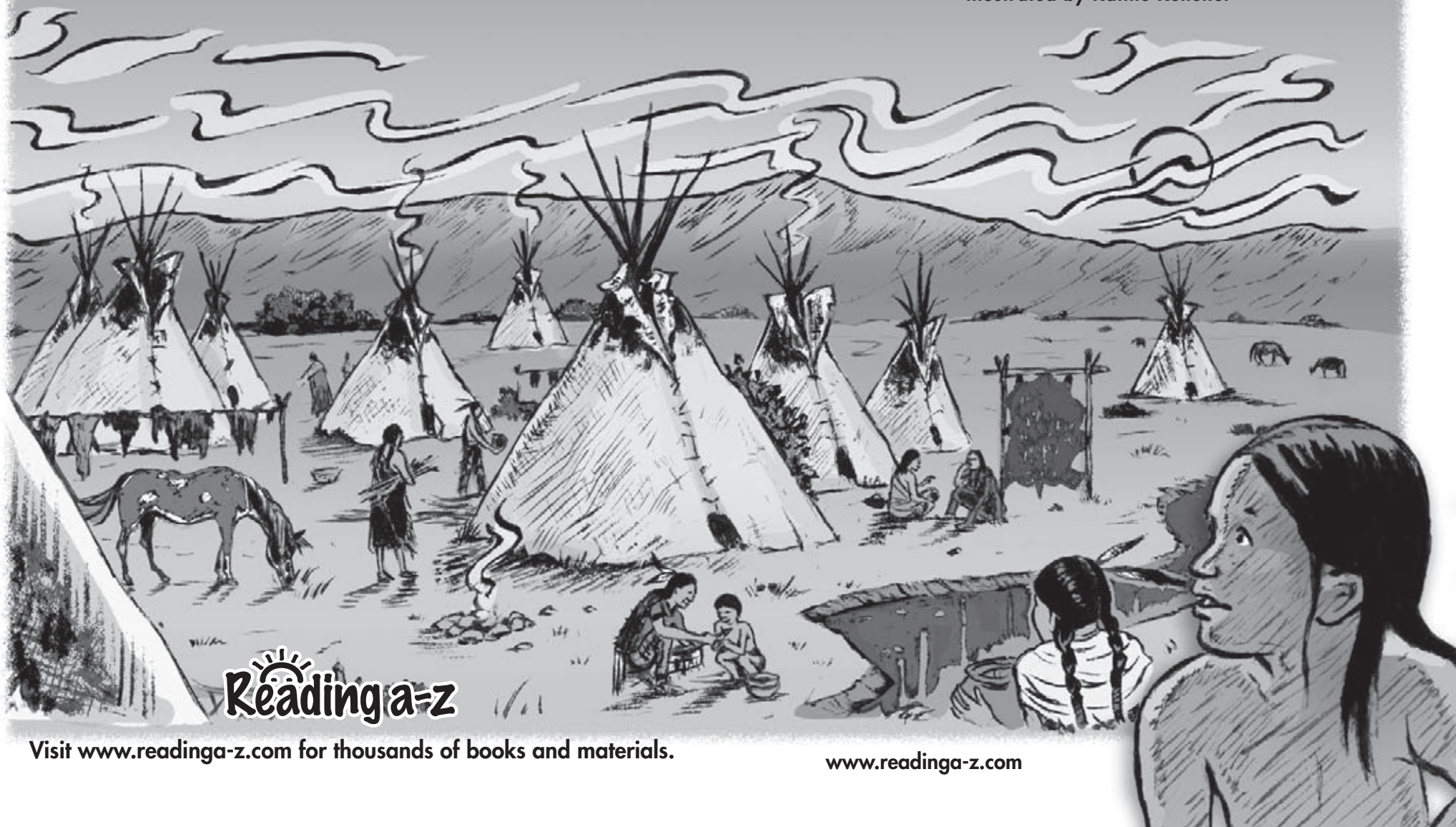
A Reading A-Z Level Z Leveled Reader

Word Count: 2,417

The Cheyennes

Written by David L. Dreier

Illustrated by Kathie Kelleher



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The Cheyennes



Written by David L. Dreier
Illustrated by Linda Pierce

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page 22: © Doug Mills/AP Images

Author's Note: An 11-year-old Northern Cheyenne boy named Black Bird is believed to have been present at the Battle of the Little Bighorn. This story is not based on the actual experiences of Black Bird as not much is known about him, but this story could have been his.

Read other books in Reading A–Z's Native Americans series:

The Algonquins, Level X
The Apaches, Level Z
The Cherokees, Level Z
The Haidas, Level Y

The Cheyennes
Level Z Leveled Reader
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Correlation

LEVEL Z	
Fountas & Pinnell	V
Reading Recovery	29
DRA	N/A

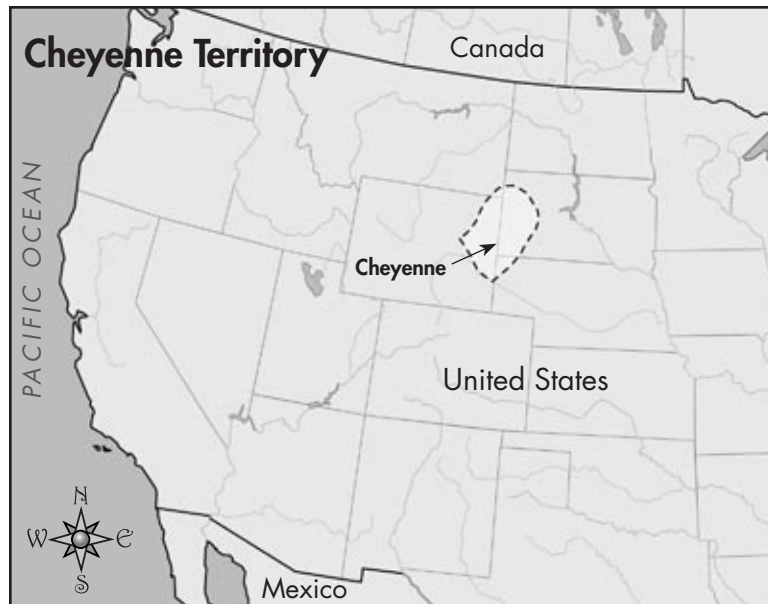


Table of Contents

The Vision Quest	4
Black Bird	7
The Buffalo Hunt	9
An Unexpected War.....	11
“Soldiers Falling Like Grasshoppers”.....	14
The Battle of the Greasy Grass River.....	17
The End of Freedom	20
Afterword	22
Glossary.....	23



The Vision Quest

The Cheyenne boy sat atop the rocky hill with his knees crossed and stared into the **infinite** sky. Day became night. Night faded into day. Then it was again night. A full moon glowed. All of nature was silent. The boy felt as though he was the only human being in the world. Never in his eleven years had he known such loneliness.

Throughout his **ordeal**, the boy did not move. Nor did he eat or drink. He was waiting for a vision that would tell him who he was. Before being taken to this remote place, he had received instruction from a tribal **shaman** and purified himself in a **sweat lodge**. Now, with his empty belly aching and his throat as dry as the dust on his moccasins, he waited. He felt faint and yearned for sleep.

Suddenly, the boy saw a great bird **silhouetted** against the moon. The bird glided downward and landed a few feet in front of him. It was huge, bigger than an eagle and as black as the night itself.



The bird looked in the boy's eyes and spoke. "You have done well, young one," it said. "I have been sent by the Great Spirit to be your guide through life. Wherever you are, there will I be also, though hidden from mortal view. Take your strength from me, and you will become a great warrior."

The boy was filled with **awe**. "I will," he promised.

"Good," said the great bird. "Now grow into manhood and prosper." With that, the bird **catapulted** itself into the air and flapped its mighty wings. In a moment, it had vanished back into the spirit world.



The sun was rising when three braves from the village came to get the boy. They found him in a deep sleep. "Look at him," one of the men sneered. "I told you he wouldn't be able to stay awake." He shook the boy to wake him. The boy's eyes opened and he sat up.

"I had a vision!" he exclaimed. The man shook his head. "It was just a dream." The boy knew otherwise, but he said nothing more. He didn't want to tell anyone about his vision until he had shared it with the shaman.

The braves gave the boy some food and water. Then the four of them started back to the village.

Black Bird

The next day, the boy went to the shaman's teepee. He sat with the shaman on a buffalo robe and told him about his vision. The holy man smiled and nodded, **wisdom** in his old eyes. "It was a true vision," he assured the boy, "not just a dream. The black bird you saw is not an ordinary bird. It is a mighty spirit who will protect you from all danger."

The shaman patted the boy's arm. "You are lucky to have such a guardian," he said. "In honor of it, you should be named Black Bird. Then whenever you hear your name, you will remember your vision."

So it was that the boy received the name of Black Bird. His father, Proud Elk, organized a celebration in his honor. The people of the Northern Cheyenne village feasted, sang, and danced well into the night.

Soon after the celebration, Proud Elk gave Black Bird a present: a brown-and-white spotted pony. The boy ran over to the pony and warmly rubbed its neck. The animal whinnied softly in appreciation. Black Bird jumped onto the horse and rode out of the village as fast as the wind. Never had he felt so glad to be alive.



Moving Onto the Plains

Originally, the Cheyennes (shy-ENS or shy-ANS) were a hunting and farming people living in what is now Minnesota. In the 1700s, they obtained their first horses. These immensely useful animals had been brought to the Americas by Spanish settlers.

The horse opened up a new life to the Cheyennes and many other Native American tribes. The Cheyennes left their settled woodland life and became buffalo hunters on the Great Plains.

The Cheyennes were pushed westward by their enemies, the Sioux (soo), who had also adopted the horse and moved onto the plains. It was the Sioux who gave the Cheyennes their name, which means "People Who Talk Strangely." The Cheyennes called themselves "Our People."

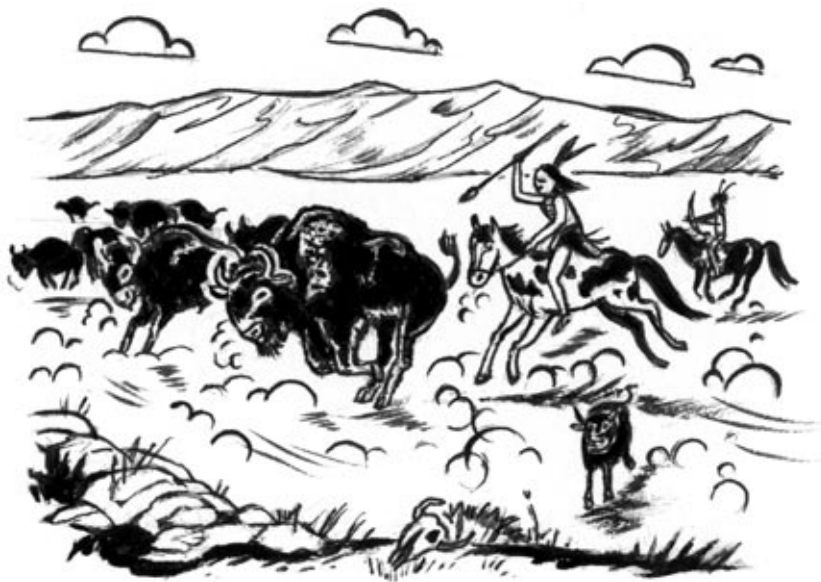
In the mid-1830s, the Cheyennes split into northern and southern groups. The Northern Cheyennes and Sioux later became allies who fought battles together against the U.S. Army.

The Buffalo Hunt

On a warm autumn day, a brave came galloping into the Cheyenne village on his horse, raising a cloud of dust. "There's a big herd of buffalo not far away!" he yelled. Within moments, all the young men in the village had grabbed their rifles or bows and arrows and were riding out to find the herd.

"Can I join the hunt?" Black Bird asked his father. "No," Proud Elk said, "You're still too young. But you can ride out and watch."

That was good enough for Black Bird. He jumped onto his pony and tore after the large group of braves that were riding toward the buffalo herd.



The women of the village were happy. They got out their cooking pots and piled wood for fires. Fresh buffalo meat for dinner!

Out on the plains, the braves rode alongside the thundering buffalo herd. Whooping loudly, they brought down one buffalo after another with bullets and arrows. Black Bird watched from the side of a low hill, wishing he could take part.

The hunt lasted for just half an hour. When it was over, dozens of buffalo lay dead on the ground. Women from the village came out to help the men strip the hides from the carcasses and cut up the meat. There would be plenty to eat tonight.

The Destruction of the Buffalo Herds



The Native Americans of the Great Plains needed the buffalo to survive. The buffalo—more correctly called the American bison—gave them food, winter robes, and hides to cover their teepees.

In the early 1800s, an estimated 30 million American bison roamed the Great Plains. By 1875, when Black Bird's story begins, the huge herds were disappearing. White hunters killed bison by the millions for meat, hides, and bones. By the late 1880s, the great herds were nothing but a memory. Only a few hundred bison remained in the United States.

An Unexpected War

Winter came and hardened everything. Temperatures dropped to 50 degrees below zero. Black Bird's people had moved their village of about sixty teepees to the Powder River in northern Wyoming. There, joined by members of a few other tribes, they huddled against the cold and waited for spring.

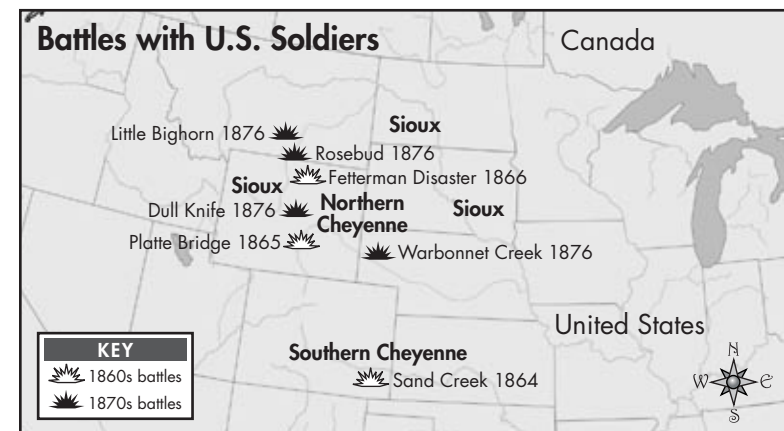
By this time—early 1876—many Native Americans on the Great Plains had given up fighting the mostly white settlers moving into their lands. They were living on **reservations** and accepting food and supplies from United States government agencies. But there were still many groups, known as the hunting bands, which refused to become “agency Indians.” They lived in an area in Wyoming and Montana that had not yet been **ceded** to the United States in a treaty. Among them were large numbers of Northern Cheyennes and Sioux. These tribes thought they were at peace with the United States. They were wrong. They were at war.

The U.S. government had decided that it was time, once and for all, to bring the hunting bands onto the reservations. It wanted to end Native American **sovereignty** in the Unceded Territory and open the nearby Black Hills to settlers.

The Black Hills were beloved by the Cheyennes and Sioux, who owned the land. But the hills were already full of gold miners, and the U.S. government had stopped trying to keep them out.

U.S. officials sent word to the hunting bands that they had to come to the reservations or face military attack. The Sioux and Cheyennes ignored this warning. As far as they were concerned, they were on their own land and harming no one. Why would the government want to send its bluecoat soldiers against them?

On a cold morning in March, Black Bird was wakened by the sound of bugles and gunshots. He jumped up from beneath his buffalo-robe blanket and ran to the entrance of his family's teepee. Outside, hundreds of bluecoat horse soldiers were attacking the village.





Throughout the village, warriors grabbed their rifles and ran outside to fight. The braves gathered at the edge of the village and began shooting at the soldiers. Many of the soldiers were setting fire to teepees.

When the fight was over, four soldiers were dead and six wounded. Only two members of the village had been killed and a few others wounded. But about half the village was destroyed. The soldiers rode away.

Now almost **destitute**, the people of Black Bird's village sought refuge with a band of Sioux led by the greatest Sioux chief, Sitting Bull. He welcomed them.

"Soldiers Falling Like Grasshoppers"

Spring came, and warmth began returning to the land. The Powder River country was peaceful.

In May, Sitting Bull led the Sioux and Cheyennes of his combined village farther north and west. They set up camp on the Rosebud River in Montana. Other hunting bands joined them. By mid-June, the village numbered more than 450 teepees and contained about 3,000 people, including some 800 warriors. A successful buffalo hunt brought fresh meat into the camp.

It appeared that the hunting bands might be allowed to spend the summer in peace. At least that's what everyone hoped. They didn't really believe it. They knew that the United States government was **determined** to turn all of them into agency Indians. It was only a matter of time before the bluecoat soldiers came back.

One day as he passed through the center of the village, Black Bird saw a sight he had been waiting to see. Men were lowering one end of a cottonwood log into a hole dug in the ground. When they had moved the log into a vertical position, its forked top towered more than thirty feet in the air. At the top of the pole was a bundle containing a buffalo hide, tobacco, and other religious offerings.

Black Bird ran into his family's teepee, where his parents and two sisters were finishing an afternoon meal. "They're getting ready for the sun dance!" he cried.

It was time for the most important religious ceremony of the Plains people. And this year, Sitting Bull would be the central figure in it.



On the appointed day, Sitting Bull danced for hour after hour around the sun pole. His arms hurt and bruised, he danced and stared at the sun. Then he went into a **trance**.



The Sun Dance

The sun dance was held once a year by many Plains tribes near the time of the summer **solstice**. It lasted for up to twelve days. The ceremony's purpose was to celebrate the sun and its role in bringing the earth back to life after the frigid deadness of winter.

When he came back to his senses, Sitting Bull said that he had seen a vision. Bluecoat soldiers, as numerous as grasshoppers, were falling upside down into the village. The meaning of the vision was clear to him: the Sioux and Cheyennes would be attacked by a large force of soldiers and would win a great victory over them.

The Battle of the Greasy Grass River

After the sun dance, the village moved again. This time it settled next to a small river in Montana that the Sioux and Cheyennes called the Greasy Grass. The U.S. settlers called it the Little Bighorn.

By this time, more people, including many from the Sioux reservation, had joined the village. More than a thousand teepees were arranged along the west bank of the river. The village contained as many as 12,000 people, including at least 2,500 warriors.



On a hot early-summer afternoon—it was June 25th in the settlers' calendar—Black Bird stood on a hill on the east side of the Greasy Grass. He gazed across the river at the huge village. Surely there had never been so many native people together in one place.

Suddenly, there was a huge **commotion** in the village. "The horse soldiers are coming!" Black Bird heard someone shout. Within moments, warriors were pouring out of teepees, weapons in hand, and jumping onto their horses. The warriors met a large group of horse soldiers at the south end of the village. There was intense gunfire, and the soldiers began to retreat across the Greasy Grass River to the safety of some high **bluffs**.

Black Bird strained to see what was going on, but the battle was too far away. He felt disappointed that he wouldn't get to witness the fight. Then, to his **astonishment**, another large column of horse soldiers came riding toward him. He could see that they intended to cross the river and attack the village from the north.

Alerted to the new attack, warriors began galloping back toward the north end of the village. They rode across the river, stopping the soldiers' attack. The soldiers retreated to a hill near the one

where Black Bird stood. The soldiers **dismounted**. Within seconds they were surrounded by 1,500 yelping warriors.

The warriors didn't know until later that the soldiers they faced that day were led by the officer they called "Long Hair"—Lieutenant Colonel George Armstrong Custer. All they knew was that they had the upper hand. And they were determined to kill every bluecoat on the hill.

The scene was one of **chaos**. The soldiers fought bravely, but the surging warriors overwhelmed them. Felled by bullets, arrows, lances, and clubs, the soldiers went down by ones and twos, and then by the dozen.

Within an hour, the battle was over. Custer and all of the 210 men under his direct command lay dead.



Charles M. Russell painted "The Custer Fight" in 1903. His painting shows Chyennes and Sioux on horseback riding toward U.S. troops on a hill.

The End of Freedom

It was a week after the battle, and the Cheyennes and Sioux were moving west. Before leaving the Greasy Grass, the warriors had tried to finish off the soldiers who had retreated to the bluffs. But then they saw more bluecoats coming and gave it up. In all, they had killed about 260 soldiers. Only a few dozen warriors had died.

It was a great victory, but it would be their last. Back east, army and government leaders were already laying plans for the final defeat of the hunting bands.

Black Bird's group of Cheyennes separated from the Sioux. The great mass of people was splitting up again into smaller bands to search for buffalo herds. Black Bird nudged his pony in a new direction, following the other members of his group. He waved good-bye to a Sioux boy he had befriended, wondering if he'd ever see him again.

The next few years were **brutal** for the Cheyennes and Sioux. The bluecoat soldiers hunted them down wherever they went. With hardly any buffaloes to be found, many people were starving. One by one, groups of Sioux and Cheyennes surrendered and agreed to live on the reservations.



On a bitterly cold morning in the winter of 1879, Proud Elk stood at the entrance of his teepee. In the distance, a column of soldiers was approaching the Cheyenne camp. With only ten teepees, it could hardly be called a village.

Proud Elk turned to his family, who were eating a meager breakfast of buffalo **pemmican**. "Soldiers are coming," he said. Black Bird was now approaching warrior age, but he knew there would be no fight. He finished his breakfast in silence as the hoofbeats of the approaching soldiers' horses grew louder.

Afterword

The United States Congress granted the Cheyennes and other Native American tribes U.S. citizenship in 1924. The 2000 U.S. Census listed more than 11,000 Cheyennes. Most Cheyennes live in Oklahoma or Montana. A Northern Cheyenne reservation in Montana has more than 4,300 residents, though some are from other tribes. The several thousand Southern Cheyennes in Oklahoma live on federal land granted to them or in Oklahoma towns. There is no longer a Southern Cheyenne reservation.

Like other Native Americans, many Cheyennes have tried to join American society, and some have achieved great success. One of the most famous is Ben Nighthorse Campbell. Campbell, who is half Northern Cheyenne and a tribal chief, was a U.S. senator from Colorado from 1992 to 2005.



Former Colorado Senator Ben Nighthorse Campbell, a 1964 Olympian in judo, speaks at the 1999 Olympic Day ceremony to honor past, present, and future Olympians.

Glossary

astonishment (<i>n.</i>)	great surprise or amazement (p. 18)
awe (<i>n.</i>)	mixed feelings of wonder, fear, and respect (p. 5)
bluffs (<i>n.</i>)	steep cliffs or hills with broad faces (p. 18)
brutal (<i>adj.</i>)	extremely difficult to cope with; harsh (p. 20)
catapulted (<i>v.</i>)	to have thrown something with great force (p. 5)
ceded (<i>v.</i>)	to have given up or surrendered (p. 11)
chaos (<i>n.</i>)	confusion; lack of order (p. 19)
commotion (<i>n.</i>)	confusion; noisy activity (p. 18)
destitute (<i>adj.</i>)	without food, clothing, or shelter (p. 13)
determined (<i>adj.</i>)	feeling a firmness of purpose, especially when facing some difficulty (p. 14)
dismounted (<i>v.</i>)	to have gotten down from the back of an animal (p. 19)
infinite (<i>adj.</i>)	endless; going on forever (p. 4)
ordeal (<i>n.</i>)	a hard or difficult experience (p. 4)

pemmican (<i>n.</i>)	dried meat pounded into paste, mixed with melted fat and dried fruit, and pressed into small cakes (p. 21)
reservations (<i>n.</i>)	lands set aside for Native Americans (p. 11)
shaman (<i>n.</i>)	a healer or spiritual leader in tribal society (p. 4)
silhouetted (<i>v.</i>)	to have caused to appear dark but surrounded by light (p. 5)
solstice (<i>n.</i>)	time of year when the Sun is farthest from the equator (happens twice each year) (p. 16)
sovereignty (<i>n.</i>)	the freedom to be in charge of one's own affairs (p. 11)
sweat lodge (<i>n.</i>)	a special place usually heated by steam and used for ritual sweating to clean or purify the body or spirit in some way (p. 4)
trance (<i>n.</i>)	a state of being in which a person seems half asleep and half awake; a state of being associated with visions or other spiritual messages (p. 15)
wisdom (<i>n.</i>)	great knowledge and sense (p. 7)

Name _____



Instructions: Place main events from the book in order on the timeline.

[illegible]

Name _____

Instructions: Place missing commas in the sentences below. On the line, write the reason for the comma(s) being used: *introductory word(s)*, *items in a series*, *prepositional phrase*, or *complex sentence*. Use your book to check your answers.

1. After the sun dance the village moved again. _____
2. Before being taken to this remote place he had received instruction from a tribal shaman and purified himself in a sweat lodge. _____
3. In a moment it had vanished back into the spirit world. _____
4. The next day the boy went to the shaman's teepee. _____
5. Originally the Cheyennes were a hunting and farming people living in what is now Minnesota. _____
6. Out on the plains the braves rode alongside the thundering buffalo herd. _____
7. White hunters killed bison by the millions for their meat hides and bones. _____
8. At the top of the pole was a bundle containing a buffalo hide tobacco and other religious offerings. _____
9. On the appointed day Sitting Bull danced for hour after hour around the sun pole. _____
10. In all they had killed about 260 soldiers. _____
11. As far as they were concerned they were on their own land and harming no one. _____
12. Felled by bullets arrows lances and clubs the soldiers went down by ones and twos, and then by the dozen. _____



Name _____

Instructions: Circle the signal word in each simile. Then write the two things being compared.

1. The sun felt as hot as a ball of fire.

_____ / _____

2. My legs felt as wobbly as strings of spaghetti.

_____ / _____

3. The fish lay at the bottom of the ocean like a sunken treasure chest.

_____ / _____

4. Hurricane winds blew through the hut like a locomotive.

_____ / _____

5. The soldier felt as unprotected as a tree with no leaves.

_____ / _____

6. The little girl was as cute as a button.

_____ / _____

7. Harrison's eyes were blue like the sky on a clear day.

_____ / _____

8. The sweater was green like the leaves on an evergreen tree.

_____ / _____

9. She stood tall like a mountain.

_____ / _____

10. The blanket was as soft as a bunny.

_____ / _____